

**BERKELEY
SCHOOL PROPERTIES
SURVEY**

BY
JESSE B. SEARS
STANFORD UNIVERSITY
CALIFORNIA

THE PUBLIC SCHOOLS · BERKELEY, CALIF.

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BY
JESSE B. SEARS
STANFORD UNIVERSITY
CALIFORNIA
DIRECTOR OF SURVEY COMMISSION

BERKELEY BOARD OF EDUCATION
AUGUST 12, 1926

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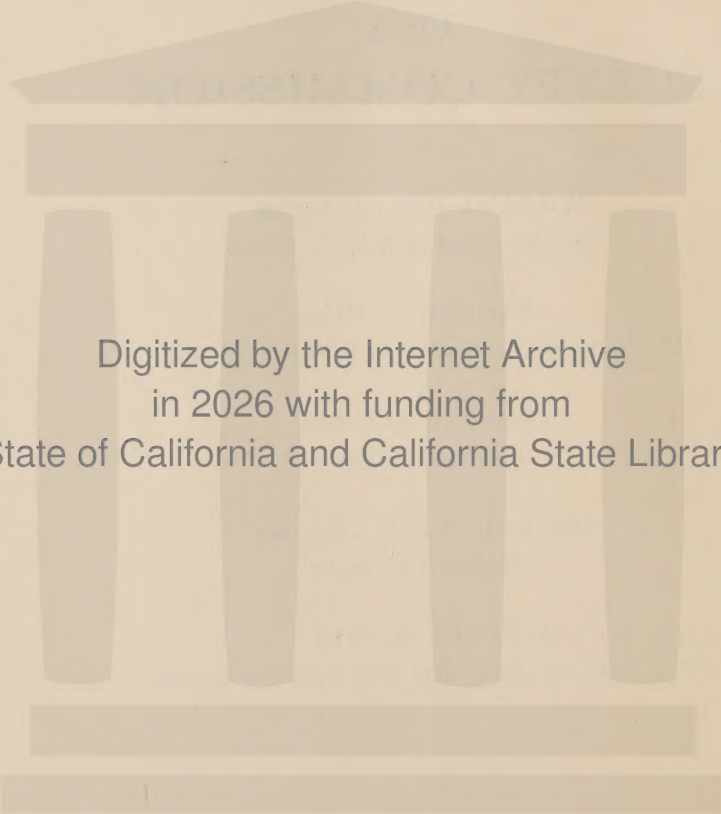
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DIRECTOR'S LETTER OF TRANSMITTAL

TO THE BOARD OF EDUCATION,
BERKELEY PUBLIC SCHOOLS,
BERKELEY, CALIFORNIA.

Directors:

Herewith I have the honor to present to you my report of a survey of the physical properties of the Berkeley school system, prepared in accordance with your resolution of January 19, 1926.

This report is presented in two parts. Part I covers a complete study of the physical properties of the schools as they are, and of the needs for extension or revision of these properties. It begins with a study of the city; to find out what kind of schools are needed, and from this proceeds to an evaluation of the present plant facilities, both buildings and grounds. This evaluation is made in the light of what the city ought to have in order that it may carry out a modern scheme of instruction. Following this study of the buildings as they stand the report then presents an estimate of the growth of the city, and of the schools, through a period of ten years, together with an interpretation of what this will require in added school plant facilities. Finally, with this estimate of the kind and extent of physical property needs in mind, it passes to a determination of whether the city is financially able to meet these needs.

In the light of these findings Part II of the report presents plans for the solution of two problems:

First, it sets up an actual program by means of which it is believed that Berkeley may be able to meet the reasonable building and grounds needs of the schools through a period of seven years.

Second, it outlines a complete plan for the financing of this program.

Throughout the report an attempt has been made to set forth the more important facts and the reasoning upon the basis of which conclusions and recommendations rest. During the time spent in gathering, analyzing, and interpreting these facts the

writer has been brought into intimate contact with almost every phase of Berkeley's school system, and as a result of this intimate touch with the working program of the schools, feels an added confidence in the practical possibilities of Berkeley's having not an average, but a superior, system of public education.

In presenting a plan of future building, however, it has not been assumed that Berkeley is or soon will be a wealthy city able to have the very most elaborate school architecture. The facts warrant and the plan proposed embodies the idea that Berkeley's policy should be to build good, plain, solid buildings, keeping in mind educational and health needs rather than city beautification as the essential purpose. This does not imply that the proposed estimates do not allow for proper architectural study and supervision of construction, but only that elaborate ornamentation is regarded as beyond Berkeley's present means.

The report has very frankly criticized the present arrangement of elementary school buildings as wrong in principle, and it has pointed out many weak points in the present plant. On the other hand, it has, in the same spirit of frankness commended the system at many points. It will be obvious enough, though it is here specifically asserted, that in no sense does any criticism in this report carry even the slightest personal reference.

In presenting this report there is one point the writer desires to make especially clear. This report offers a definite proposal for an extensive plan of building, and an equally definite proposal for a plan for financing the building program. It has been necessary to be specific at many points in these plans. It is recognized fully that future conditions may be different from what has been anticipated by this report. Labor may be scarce, markets for building materials may be high, the city may grow much more rapidly than estimates suggest, and in many details it may be found unwise to follow the plan literally in its details. This report does not pretend to foresee all the difficulties that will be met during the period of construction. It attempts to point the way clearly and to suggest the rate of progress that now seems possible and advisable to try to maintain. If the report is adopted it is believed that the people of Berkeley may reasonably expect their Board of Education to hold to its essentials. No one, however, and the writer least of all, will expect the Board to adhere to it in its smaller details.

In addition to furnishing a general program of procedure for the development of the city's school plant, it is hoped that this report may be of service in bringing to the attention of the taxpayers and of the business interests of the city the fact that public education is one of Berkeley's largest and most important enterprises, and one that is intimately interwoven with all the social, intellectual, religious, civic, and business interests of the city.

It is a pleasure to state here that throughout the work of these investigations the writer has received every possible assistance from school officers and has had the freest access to all records and documents required.

Respectfully submitted,

JESSE B. SEARS,

Director of the Survey.

Stanford University.

August 12, 1926.

AUTHORIZATION AND MANAGEMENT OF THE SURVEY

The survey of the physical properties of the Berkeley school system was provided for by resolution of the Board of Education of date January 19, 1926. Previous to this date the writer was consulted about the entire matter of the survey, including both the membership of the survey commission and the general scope of the investigations that would be required. As will be seen from the resolution, the limits of the investigations were left entirely to the discretion of the survey commission.

Omitting reference to the tentative budget provided for the survey, the resolution, taken from minutes of the Board of Education, reads as follows:

Moved by Director Stringham, seconded by Director Bright—That the following resolution be adopted:

Whereas, the schools are overcrowded and the housing facilities available are gradually becoming more inadequate, and

Whereas, the improvements necessary to meet the conditions must be determined speedily and with every possible accuracy,

Be it Resolved, First—that the Board of Education believes that an impartial and scientific survey is desirable to determine the immediate land and building program which should be undertaken. Therefore, the Board does hereby order such a survey made.

Second—That for the purpose of carrying out said survey, there shall be and there is hereby established a Survey Commission consisting of five members, one of whom shall serve as executive head and be designated as Director of the Survey. It shall be the duty of the Director to take active charge of the planning and of the execution of the survey, organizing the Commission in such way as to enable it to function so as to bring the largest and most satisfactory result possible in the matter for which they are made responsible. He shall have access to such school properties, records and accounts as he may require, be free to consult with and to ask for information from school officers, and be empowered to employ such professional, technical, and clerical assistance as may be found necessary, provided that all such service shall be requisitioned for before such employment is entered into, as is customary in the method used by the business office in regulating

expenditures. It shall be his further duty to prepare and to present to the Board of Education a written report of the survey in suitable form for publication and presentation to the public by the Board. It shall be the duty of other members of the Commission to serve in a general advisory capacity, to attend meetings called by the Director, and to give consideration to and counsel upon matters referred to them by the Director or initiated by them.

Third—That the following appointments to membership on the Survey Commission be made:

As Director of the Survey—Professor J. B. Sears of Stanford University.

As Associates on the Survey Commission:

Dr. Herbert R. Stoltz, State Supervisor of Physical Education;

Mr. A. P. Hill, Assistant Superintendent of Schools, San Jose;

Mr. Wm. John Cooper, Superintendent of Schools, Fresno;

Mr. Chester Rowell, Publicist of Berkeley.

A preliminary review of the situation was begun at once and certain investigations were put under way. On February 10th a meeting of the Survey Commission was held at which the plans for the survey were presented and approved. During this visit the members of the commission made some direct contact with the building situation and some of the more obvious problems and needs of the schools were discussed.

At a later date the Board requested that the survey cover the work of the business management of the school system. While various aspects of business are touched upon incidentally throughout this report, a separate report on that subject is devoted to this problem.

After the investigations were well along and a general plan of procedure had been prepared, a second meeting of the commission was held, at which the findings were gone over with care and some consideration given to certain major propositions affecting reorganization and the plan for financing the program.

A final meeting of the commission was held in July, at which the report was gone over and approved by the commission.

Acknowledgment should be made here of the valuable aid obtained from the members of the survey commission, individually as well as in conference, upon many difficult or technical problems during the investigations. Especially is it appropriate to

acknowledge extensive architectural and engineering assistance from Mr. Hill, important assistance in the evaluation of playgrounds and playground needs from Dr. Stolz, and excellent suggestions on matters of general administration and finance from Superintendent Cooper and from Mr. Rowell.

It is a pleasure, too, to acknowledge assistance from City Manager John E. Edy and his staff for helpful coöperation; from Professor John Almack of Stanford University who, with Mr. Hill of the commission, scored the buildings; and from Miss Elise H. Martens for valuable statistical assistance. The writer wishes especially to thank Superintendent H. B. Wilson, Office Manager George S. Mouser, Building Superintendent Orville P. Pratt, Research Director Virgil E. Dickson, Mr. Donald H. Biery, and each of the supervisors and school principals for the hours of painstaking work they put into the preparation of materials essential to the completion of the work of this survey.

JESSE B. SEARS.

PART I

BERKELEY'S PRESENT HOUSING
FACILITIES

INTRODUCTION

CHAPTER I

THE PROBLEM OF THE SURVEY

I. THE NEED FOR A SURVEY

The survey called for in the resolution above quoted has to do with the physical properties of the Berkeley school system. Are the buildings and grounds adequate and adapted to the requirements of a modern school system? If not, then what can be done, what is the city able to do, and how should the city proceed in order to bring its school plant into suitable condition?

During the World War there were few school buildings erected in the country, though the school population increased at very little less than its previous rate. The result has been that most communities have fallen far behind in plant development.

Berkeley was fortunate in having completed an extensive building program in 1915 and 1916 which covered most of the needs that had been accumulating since 1909. Following 1916 there was another gap extending to 1920, at which time four new buildings or major units of buildings were erected. Since then the needs have been met very largely by constructing temporary cottages.

In 1915-16 Berkeley's school population, not counting part-time and evening classes, was approximately 9,100. In 1919-20 it was 10,500. Now, six years later, it has grown to almost 14,000. If the six new buildings added in 1915 and 1916 could care for an expansion of only about 1,400 pupils, it is reasonable to assume that the four buildings added in 1920 are heavily taxed, caring to date for an expansion of some two and one-half times this number.

As a city Berkeley has grown with great rapidity and, in its development it has been influenced by many outside forces. In the forty-eight years since the present school system was established Berkeley has changed from a small country village to a city of approximately 75,000 people. During these years there have been many shifts in the distribution of homes, business, and

industries and it would be unreasonable to assume that such changes could go on without affecting the organization and welfare of the schools.

Corresponding to this, too, there have come remarkable changes in school organization and in the program and the processes of instruction. A building well suited to the school work of twenty-five years ago is not well suited to the work that is going on in the schools of today.

Berkeley has maintained its buildings extremely well, with some exceptions one is almost tempted to say, too well. Further, by alterations and by use of far too many temporary cottages and annexes the old plants have been stretched and revised in an effort to meet the growing numbers and the expanding curricula and school activities. This policy of patching and skimping cannot go on indefinitely. Even casual observation shows that it has even now gone so far in Berkeley that at many points the buildings are dictating instructional policies.

Being a relatively young city, the problem of rebuilding its schools has scarcely been felt as yet in Berkeley. With its oldest buildings dating back to 1892, however, it is clear that a program of replacement must soon begin.

Such facts as are noted above, which are merely suggestive of the types of evidence that will be considered in this report, serve to remind us that Berkeley's school building problem is each year becoming more complicated and so more difficult to solve. The problem of rebuilding must in time take its place along side of the problem of new expansions. When this time comes in the life of a school system there is afforded an opportunity to make major readjustments in plant such as will recognize the changes that have taken place in the city and in the purposes, the organization, and the processes of instruction.

In a replacement program new buildings ought to be located and constructed with reference to the conditions and needs of today and of such future demands as can be foreseen, and not with reference to the needs for which the original buildings were planned and located. It is only by a thorough analysis of these educational factors that we can hope for a sound policy in the matter of school buildings.

2. THE PROBLEM STATED

To state the problem of this survey is to explain, therefore, what investigations are needed in order to provide the best possible fact basis for making the decisions necessary to the expansion and reconstruction just suggested. The school authorities are confronted with the practical question of how to alter and expand the present school plant so as to cover new needs and meet the demand for replacement of old buildings, and of how to do this with proper regard, not only for financial economy, but also for sound educational policy.

Specifically the questions that present themselves for solution are:

1. What are the present and near future needs of the city for school buildings?
2. What is the ability of the city to satisfy these needs?
3. By what steps should the city proceed in the development of its building program?

It goes without saying that proper answers to these questions will take account of the schools as they are. We cannot, nor do we desire, to break with the past and discard expensive buildings because they are slightly out of date. Both economy and common sense dictate that we shall get as much service out of a building as is consistent with sound educational practice and with the financial status of the community. In a factory it is possible to determine just when an old building or machine should be replaced by a new one. There the units of output are easily counted and evaluated. This is not so easy in education, where the product is in the form of the more or less intangible things we call knowledge and skill, or culture.

The modern school, however, is less vague in its purposes than were the schools of a few decades ago. Today we set up a definite scheme of instruction, designed to accomplish certain fairly well defined objectives. In many instances we are prepared to define with some precision the extent to which those objectives have been achieved. Accordingly, obsolescence in school buildings can be defined now as it could not have been defined when the present tax-payers of Berkeley were pupils at school.

It must be remembered that for more than a thousand years education changed very little, so far as building needs were con-

cerned. A room of most any sort would do, so there was a teacher and pupils in it. With a static program of education there was no such thing as obsolescence in buildings and equipment. More recently, however, the same science that has made over the affairs of business and industry has made over the school. The result is far better schools in every sense. Yet, with this improvement has come great specialization in the school program; specialization that affects the school plant as much as it affects curricula, text-books, methods, and classroom management. Thus, by our progress we have introduced the possibility of a new type of overhead cost which, in accounting parlance, we call obsolescence of buildings and equipment.

The public school has gone through a half century of experimenting, and in spite of some waste and mistakes, this experimenting has been of inestimable value and it must continue. We shall make other mistakes, no doubt, just as we have done and are now doing in business and political affairs, but without experimenting we would unquestionably suffer far greater waste from stagnation and misadjustment.

Recognizing the difficulty of defining amounts of obsolescence or of saying when a building is so obsolete that it cannot be used and admitting that the administration of education is no more scientific than is the administration of business and politics does not relieve us of the necessity of making decisions about altering or determining the best use that can be made of old school buildings and equipment. What we want in reaching these decisions, however, is not mere opinion alone, nor sentiment, nor argument, but fact. To assemble and to try to interpret the facts necessary to answer the three major questions set forth above will be the purpose of this survey.

3. THE NEED FOR BUILDINGS

The need for school buildings must be examined from several angles. As a single comprehensive viewpoint, we may say that the need for buildings must be thought of as the need for a proper home for the program of the schools. It is not a question of shelter alone, as those of us who quit the school a quarter of a century ago are too prone to think. As already noted, a school building, like a bank, a store, a factory, a church, or an office building must be designated with reference to the activities it is

to house. Accordingly, the beginning of a school building is not the plans of an architect, but the plans of the schoolmaster.

The need for buildings thus interpreted will show the adequacy or inadequacy of the plant as it now stands and what will be required to meet the needs of the near future. To what extent do present buildings provide adequate room; to what extent are the rooms properly designed; are they arranged in suitable units; do they provide safe and healthful homes for growing children; are they located so as to be easily and safely accessible to all; are they provided with adequate playgrounds and play equipment; are they properly maintained and operated? Having examined the present buildings with reference to these points, we must then project these needs into the future as far as we can and set down as definitely as we are able the changes and the number and kinds of extensions that will be necessary to keep the schools properly housed. For a city of the character of Berkeley it seems impossible to project this program through a period of more than a decade with any reasonable assurance.

4. ABILITY OF THE CITY TO SUPPORT SCHOOLS

In any public business we cannot wholly ignore the question of economy. There are some public wants, however, that practically dictate what the public shall pay. No matter how hard it may be to pay taxes, we shall continue to have police protection, courts, execution of statutes and ordinances, and supervision of health conditions. We cannot live without these services. The school, as a factor in safety, and in part it must be viewed as such, is to some extent in this class of public necessities. We are coming more and more to realize that the very best police, court, and health service is the least expensive, and there is little doubt that this is equally true of public education.

Even so, with so many public needs to meet, we are forced to consider the question of wise spending. In a modern city, many of our public needs grow faster than either population or wealth, so that normally we can have a constant or a declining tax burden only at the cost of living in an unprogressive community. Thus the social and economic development of a city is intimately tied up with this question of liberality in taxation. Whether there is danger of too heavy a tax or not, however, and whether or not the community believes in superior government and superior schools we cannot ignore the necessity for examining the economic

consequences of our public services for, at least the same rules of economy should apply in public as in private business. Accordingly a program of school-house building must be formulated in the light of the cost burden involved and in the light of sound methods of financial management.

5. THE PROGRAM OUTLINED.

Having determined the educational needs, and the implication of these needs for a program of instruction; secondly, having arrived at some estimate of the city's financial ability to pay for schools as one of its many public services, we next turn to a consideration of just what is needed and of just how to proceed.

Here our first concern is with the question of how to get the very most use out of the plant as it now stands. From the standpoint of good educational service at reasonable cost what alterations or what new uses can be found for the present old buildings; can the better buildings be made to render larger service; what revisions are needed and what of these are practicable?

Beyond the question of alterations and revisions there is the question of the development of entirely new facilities and new sites, and also the question of new types of schools. In solving these problems there are at least two major considerations involved. First, there is the question of future expansion of school population; second, where old buildings are to be replaced, there is the question of a possible redistricting of the city where population shifts have materially altered the conditions or changed the center of population.

Having determined what alterations and what new construction are required it is then necessary to distribute the work through a period of time in such a way as will care for school needs in the order of their urgency and at the same time spread the cost over such a period as will have proper regard for the taxpayers of today and yet not overlook the probable burden which will have to be met by taxpayers in the succeeding decades.

6. THE INVESTIGATIONS NECESSARY.

To answer the three main questions set forth above in a way that will satisfy the requirements here outlined will call for numerous investigations of the schools, both as they are and as changing conditions will prefer them to be. The policy and program, the

present buildings and their suitability for service in a modern scheme of instruction, the needs for modifications and expansions, and the methods of financing the project all must be examined.

THE POLICY AND PLAN OF INSTRUCTION. A scheme of education must be worked out with reference to the needs of the people themselves. These needs are by no means alike for all children. Children are unlike, first, by inheritance and in what they have learned before they come to school. This applies equally to physical, mental and social equipment. They are unlike, second, because they are going to do widely different things in life as adults.

In spite of these differences there is much that we want all our children to have in common. The common virtues, health, citizenship, knowledge of reading, writing, and numbers, the history and ideals of our country, and a knowledge of customs, manners, dress, and speech,—these are educational objectives which we set up for every child alike. For some children, however, much of this is provided in the home and by ordinary experience. For others there is little of this accomplished outside the school. Accordingly, the school must devise a program that can take each child where he is, or each group where it is, and meet the needs of the specific child or group and not the needs of some mysterious average child. This affects the curriculum and it affects the school building also.

Equal importance attaches to the fact that children are not going to live the same kinds of lives. Some will quit school as soon as possible to begin work as earners, while others will attend school for fifteen or eighteen years. Their anticipated careers, social as well as occupational, in part indicate their educational needs and should dictate the program of instruction they are to receive. This does not refer to early specialization in training, such as would require special types of buildings, but more especially to the fact that every program of instruction beyond the elements of learning above mentioned, and in no small way including the earliest training, must be rich in its contacts with the world of affairs. The old school of books must give place to the school where, in addition to books the child learns by doing, by being a responsible member of a society, by applying his book learning.

Thus, who they are when they come to school and, how they are going to live and what they are going to do after they leave

school, as well as how much schooling they may take, are factors that dictate the nature and extent of the instruction we provide. Facts bearing upon these questions must be brought to light and their meaning for a practical scheme of instruction revealed. Further studies of the population, with its rate of growth and its social composition, a study of industries and occupations, and a study of literacy will furnish the necessary bases for judging the educational needs and the efficiency with which these needs are now being met. These studies will be presented in Chapter II.

THE PLANT AS IT IS AND AS IT SHOULD BE. Once we have the facts that will indicate the educational needs of the city, we can then determine from those facts the plan of organization that will be required. In the light of the demands of such a scheme, we can then turn to a study of the present school plant as it stands. Here, investigation of the buildings from the standpoints suggested above, revealing their adequacy and adaptability for a sound program of instruction will be the problem for the survey. Are the buildings where they should be, are they hygienic and safe, are they comfortable and convenient for school work, and how can the present buildings and grounds be used to the best advantage as the school population grows? These are the lines of investigation that are necessary if the school building problems are to be solved.

Investigations covering these matters will be presented in Chapter III, while Chapter IV will present estimates of the needs to be met through the next decade.

FINANCING THE PROGRAM. Finally the problem of the cost of the new program, and how to finance it will call for studies of the rate at which the new burden must be assumed, what this will mean in the form of tax rates, and the bearing of this cost upon the total of public expenditures for the community. Investigations concerned with the estimate of Berkeley's ability to finance a building program will be presented in Chapter V and the proposed plan for financing the program in Chapter VII.

Thus, by these several groups of investigations we may reasonably hope to find satisfactory answers to our questions. In so far as possible these answers will be set forth in terms of facts and accepted principles. Where opinion is expressed, the basis of the opinion will be made clear. In no small way the financing problem with which this survey is concerned is precisely similar to the

problems with which business and industry are constantly faced. As business makes estimates, the best estimates it can, that a proposed investment will pay, so we shall here make the best estimates we can of how to invest in an educational plant.

The report will be presented in two Parts, Part I dealing with present housing facilities, and Part II with the proposed building program. Under Part I we shall consider the following problems:

- Berkeley's present educational needs.

- Adequacy of the present school plant.

- The estimated growth and needs of the next decade.

- Berkeley's ability to meet these needs.

In Part II will be presented:

- The proposed building program.

- Plan for financing the program.

CHAPTER II

BERKELEY'S EDUCATIONAL NEEDS AND PROGRAM

I. PHYSICAL AND SOCIAL CHARACTERISTICS OF THE CITY.

BERKELEY'S POSITION. The city of Berkeley forms one unit in a family of municipalities fringing San Francisco Bay. As a single cosmopolitan center this group of cities includes almost a million people, or nearly one-fourth of the population of the state at the present time, and each of these cities is growing at a rapid rate as the development of the West goes forward. For obvious reasons, this center is the great western gateway of the country, and as such it has faced and must continue to face all the problems—social, industrial, political, and educational—that are peculiar to such population centers.

Berkeley is an integral part of this larger community and much that appears now as evidence of poor management in city planning has its explanation in the fact that in its earlier years the city had to serve so many divergent purposes. From farms and gardens it became a place for country homes, first by the bay and then on the hillsides; a great university center; a place for the overflow population from San Francisco following the disaster of 1906; a place for the expanding industries of the bay region; and, lying in the path of the main lines of two great railroads as it does, it has had serious difficulty in finding any excuse for the unity of purpose and effort that are so essential in city building.

Some of the results of these many conflicting interests are clearly shown in Fig. 4 of Chapter III. Only casual examination of this map is needed to convince one that this struggle is not yet ended. There are some evidences, however, that this aimless game of tag, where gardens, residences, business, college instruction, industry, and transportation systems have been the chief performers, is coming to an end and that Berkeley is rapidly becoming a city. Nothing indicates this more clearly than do Berkeley's system of government and its regard for public schools, and nothing makes such an outcome more certain than does a combination of good government and good schools, backed up by a rapid growth of both population and wealth.

Berkeley is hemmed in on all sides so that future growth of the city must be from within the borders of its ten or eleven square miles of territory. Without state legislation permitting a city to extend its boundaries across a county line Berkeley has little chance of geographical expansion. With the bay on the west, Oakland on the south and east, and the county line on the east and part of the north, the only possible chance of geographical expansion would be to take in the town of Albany on the north. For the good of the education of Albany's children this ought by all means to be done. Considering Albany's assessed wealth it seems next to impossible for the city to finance a high school of its own. Being hemmed in so closely on all sides will gradually compel a greater self-consciousness, and out of the need for orderly growth will come such common purposes as were impossible of development in the earlier years.

THE GROWTH OF THE CITY. The most important factor involved in outlining a plan of school plant expansion is that of numbers of children to be provided for. A growing city represents a very different problem from that of a city whose population is stationary, or declining. Table I shows the growth of the community as a whole and of the various population groups separately, together with the population of the state, and with that of Alameda County, which latter includes the cities of Berkeley, Oakland and Alameda.

From these figures it is clear that the most rapid growth is in the east bay region, and that Berkeley has been responsible for a fair share of the total increase. The growth in population for San Francisco during the decade 1910 to 1920 was 21.5 percent. For Oakland the increase was 44 percent, and for Berkeley 38.6 percent, while for the entire group of cities and towns the increase was but 29.5 percent. These figures are below the corresponding figure for the entire state, which was 44.1 percent, yet these cities have grown rapidly, and there is reason to assume that these rates are being fairly well maintained.

TABLE I

GROWTH OF POPULATION IN THE BAY REGION AND FOR THE STATE OF CALIFORNIA, 1870—1920
With the Percent Increase by Decades

Locality	1870		1880		1890		1900		1910		1920	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
San Francisco.....	149,473	.....	233,959	56.5	298,997	27.8	342,782	14.6	416,912	21.6	506,676	21.5
Oakland.....	10,500	.....	34,555	229.1	48,682	40.9	66,960	37.5	150,174	124.3	216,261	44.0
Alameda.....	1,557	.....	5,708	266.6	11,165	95.6	16,464	47.5	23,383	42.0	28,806	23.2
Richmond.....	No data available								6,802	.....	16,843	147.6
Albany.....	No data available								808	.....	2,462	204.7
Berkeley.....	No data available				5,101	.....	13,214	159.0	40,434	206.0	*56,036	38.6
Cos. Terr.....	161,530	.....	274,222	69.8	363,945	32.7	439,420	20.7	638,513	45.3	827,084	29.5
State.....	560,247	.....	864,694	54.3	1,213,398	40.3	1,485,053	22.4	2,377,549	60.1	3,426,861	44.1
Alameda Co.....	24,237	.....	62,976	159.8	93,864	49.0	130,197	38.7	246,131	89.0	344,177	39.8

*Figure sometimes given as 57,295 which includes population of Ocean View precincts 1 and 2, annexed in 1921.

When Berkeley is compared with other western cities, as may be done from Table II, it becomes clear that its rate of growth has been very substantial.

From 1890 to 1900 Berkeley held second place among the twelve western cities of its class. During the next decade, with a 206 percent increase, it held third place, and in the last decade it held seventh place. While Berkeley seems to have fallen behind

TABLE II

POPULATION STATISTICS OF WESTERN CITIES

Showing Population for 1920 and the percent of increase by decades from 1890 to 1920

City	Population 1920	1900	1910	1920	1930 (Estimated)
Long Beach.....	55,593	299.3	690.8	212.2	73.8
San Diego.....	74,683	9.5	123.6	88.7	51.0
Fresno.....	45,086	15.3	99.6	81.1	48.6
Stockton.....	40,296	21.4	32.8	73.3	45.9
Pasadena.....	45,354	86.7	232.2	49.7	36.1
Sacramento.....	65,908	11.0	52.6	47.5	34.1
BERKELEY.....	56,036	159.0	206.0	38.6	32.5
San Jose.....	39,642	19.0	34.6	37.0	29.3
Ogden.....	32,804	9.6	56.8	28.2	23.9
Salt Lake City.....	118,110	19.4	73.3	27.3	23.3
Tacoma.....	96,965	4.7	122.0	15.8	14.8
Spokane.....	104,437	84.9	183.3	less than 0.1	less than 0.1

it must be kept in mind that in the last decade most of its growth has been from within, while in Salt Lake City, Spokane, San Diego, Long Beach, Pasadena, Stockton, and Fresno, considerable land areas have been added.¹

COMPOSITION OF THE POPULATION. In addition to mere numbers or rate of growth in population, school plant expansion must take place in terms of the type of education that must be provided. Here it is not numbers alone, but the particular kinds of children that dictate the policy. A large foreign born group will require temporary segregation in special classes and large numbers of small classes until the language handicap is overcome. It will

¹ According to *Financial Statistics of Cities* (Using 1919 and 1923) all these cities have added to their territory. Berkeley has added only a very small amount.

usually require a larger amount of continuation training and a larger health program, to say nothing of various lines of desirable specialization through junior and senior high school. All this means more classrooms, and special types of equipment, and more need for assembly and club rooms to be used by neighborhood groups.

In the matter of foreign population Berkeley is a favored part of the Bay region and, indeed, of the entire state; first, because of the rather high class of foreign people who have come to Berkeley, and second, because of the relatively small numbers who come, as may be seen from Table III. In this table is shown a percent distribution of the population of the various Bay cities by racial groups through a period of three decades. From these figures it is clear that the entire state is receiving fewer foreign people, that the Bay cities are receiving relatively fewer than are coming into the state as a whole, and that among the latter, Berkeley is attracting fewer than are the other cities.

By a race survey recently made of the school children of the elementary and junior high schools it is shown that 66 percent of the fathers and 70 percent of the mothers were natives of this country. Of the foreign fathers 18 percent were English, or Canadian, 13 percent were Scandinavian, 12 percent were Italian, 12 percent were Russian and Finnish, and 8 percent were German. The distribution of foreign mothers was only slightly different from this. Of the 17 elementary schools only five or six have any large numbers of children whose parents are foreign born. All four of the junior high schools, however, have considerable numbers of children from these and other foreign groups.

With the industrial development that is under way in West Berkeley it is not certain, however, that this will continue, though it is clear that the problem of foreign children does not enter seriously into the development of Berkeley's school policy at the present time. This is further emphasized by the fact that in native white stock of native parentage Berkeley holds a median position among the twelve western cities listed in Table II.

These figures mean that Berkeley has a fairly homogenous population. This means relatively less diversity in educational needs and so a relatively narrower program. This must not be over-emphasized, however, for after all Berkeley has some racial diversity and the special needs of those children cannot be ignored.

TABLE III

PERCENT DISTRIBUTION OF RACIAL COMPOSITION OF POPULATION
(Data for Albany not available)

Locality	Native Whites			Foreign Born Whites	Negroes	All Others
	Native Parents	Mixed Parents	Foreign Parents			
San Francisco						
1900	24.4	11.4	28.7	30.4	0.5	4.6
1910	27.7	11.2	25.7	31.4	0.4	3.7
1920	33.0	11.2	24.8	27.7	0.5	2.8
Oakland						
1900	37.0	12.1	23.4	24.2	1.5	1.7
1910	36.8	11.3	21.9	24.5	2.0	3.4
1920	41.7	11.3	20.4	20.9	2.5	3.1
Alameda						
1900	38.1	35.5	23.3	0.9	2.2	
1910	37.8	13.5	21.0	23.8	0.9	3.1
1920	42.2	13.4	20.6	20.4	0.8	2.6
Richmond						
1900	Data not available					
1910	47.6	26.0	24.1	0.4	1.8	
1920	48.8	10.6	17.9	21.4	0.2	1.1
BERKELEY						
1900	39.9	35.1	23.2	0.5	1.4	
1910	48.2	11.7	17.6	18.9	0.6	2.9
1920	51.2	11.7	16.7	17.1	0.9	2.4
Cos. Terr.						
1900	27.3	39.1	28.9	0.6	3.9	
1910	31.7	35.3	28.6	0.8	3.5	
1920	37.2	11.3	22.8	24.8	1.0	2.8
State						
1900	43.4	10.7	19.0	21.3	0.7	4.8
1910	46.5	9.8	17.0	21.8	0.9	4.0
1920	49.0	9.7	16.7	19.9	1.1	3.6
Alameda Co.						
1900	34.0	36.9	25.5	1.0	2.5	
1910	37.4	33.7	24.2	1.4	3.2	
1920	42.1	32.1	21.0	1.8	2.9	

Further, it is not children alone for whom we build school houses today, but parents as well.

OCCUPATIONS OF THE PEOPLE. Another important index to educational need, and hence to school housing needs, is the distribution of the people in the matter of occupations. What a man does or what a child is to do in the world suggests what he needs to know, and so, to some extent what the schools should teach him. The community must carry on its life work, and each generation must take its turn in assuming the responsibilities. Many individual children will break away from the occupations of their fathers to be sure but this is never true of an entire community, except through a long period of gradual readjustment.

In bringing the schools to bear upon life in this sense we are shifting from an old to a new conception of education, from the idea of the school as a conserving to that of a directing factor in social evolution. This new philosophy has been accepted by the modern democratic state and the present day school system is expressing it in its curricula, in its methods, in its organization and also in its school plant.

Specifically it touches the problem of this survey in the fact that, roughly speaking, our homes dictate the occupational aspirations, and later, to a fair extent, the actual occupations of the children. Some will leave school as soon as possible, others will stay to the end of the program offered. Some will look toward a trade, others toward a profession, and so on in wide variety, and these aspirations indicate the objectives toward which the schools must operate.

Data provided by the high school principal show that during the past four years the following numbers of graduates have entered the state university. In 1922 out of 398 graduates 216 entered the university; in 1923 there were 168 out of 431 graduates; in 1924 there were 213 out of 512 graduates, and in 1925 there were 183 out of 545 graduates. Out of 409 prospective graduates for the current year 322 have stated that it is their intention to go on for additional training, 262 to college and 60 to business or other special types of technical training. Of these pupils a very high percentage have not only decided to go for further training but they have that training in mind as preparation for specific callings. Many of these callings are professions though many are not commonly so classed. The training required is in many cases

extensive and taken together is widely varied. The group not intending to go further to school is looking toward a wide variety of occupations, including trades, business, clerical service, music, and art.

It is assumed here that social needs and aspirations, as well as individual needs and aspirations, are intimately related to occupational life; secondly, that occupational and leisure time activities are also more or less related to each other. Accordingly, education that ignores occupational life is ignoring our leisure time needs as well. When we put these two sets of needs to-

TABLE IV

OCCUPATIONAL ANALYSIS OF BAY CITIES

(Cosmopolitan Territory)

1910—1920

Class of Occupation	No. in Each Occupation per Thousand Employed											
	San Fran.		Oakland		Alameda		Berkeley		Cos. Terr.*		State	
	1910	1920	1910	1920	1910	1920	1910	1920	1910	1920	1910	1920
Agricult.....	15	14	23	17		27	17	19	17	15	203	180
Ext. of Min.....	5	5	9	5	No	4	8	4	6	5	28	16
Mfg. Ind. & Mech.....	318	309	319	393	Data	341	273	293	316	329	263	285
Transp.....	120	101	126	97	Avail-	80	80	65	119	97	94	83
Trade.....	172	163	186	159	able	173	185	156	176	162	137	138
Publ. Serv.....	46	58	16	19		19	17	19	38	45	22	30
Prof. Serv.....	62	75	76	78		95	151	188	69	83	64	77
Dom. Serv.....	165	134	146	114		80	148	98	160	125	127	102
Clerical Occ.....	97	142	98	118		180	123	158	98	138	61	88

gether, therefore, we have the whole of our cultural needs upon which school training must be focused.

In Table IV are presented the facts about the occupational distribution of Berkeley's population as compared with those for the other Bay cities. From these figures it will be seen that Berkeley leans somewhat toward the professions and not so much toward manufacturing and mechanical pursuits. With the growth of industries this distribution is undergoing some change, though at present there is no large population of unskilled laborers, whereas there are large numbers who are engaged in pursuits requiring extensive specialized training. For some of Berkeley's

children then, we must expect to provide extended school training, while for others the needs will be different and less extensive. This applies, too, to the adult occupational groups which these children represent. In addition to the matter of recognizing the work life of the people the schools must enter intimately into the play life of the children, and also into the leisure life of the adults. This means a different kind of building; and it means larger play facilities in crowded industrial communities than would be required for certain other communities where other types of occupations dominate. Further, the streets are more dangerous there, and the noises and stir on every side, combined with relatively larger families, make it necessary for the city to supplement the provisions that can be offered by the home. While this has not been wholly ignored in the past, and while Berkeley has no crowded tenement districts filled with sweat-shop workers, it has the beginnings of an industrial section. In replacing its old school buildings, which must be done very soon, the city has an excellent opportunity to make high class provision for the proper development of this important part of future Berkeley.

THE PROBLEM OF ILLITERACY. Another factor that is involved in the development of a school program is the matter of illiteracy. Table V shows the number and the percent of illiterates in the Bay cities. From these figures it is clear that the Bay region occupies a favored position in the state, and that Berkeley has a decidedly favorable position. In such a population the problems of continuation training and of Americanization work are much simpler than they are in most cosmopolitan cities and than they are throughout the state generally. When compared with the western cities of its class Berkeley also stands high, only three of the group of twelve having less illiteracy. This merely substantiates evidence already discussed, and shows that part-time, continuation, and Americanization work are not the burden in Berkeley that most cities are confronted with.

THE EDUCATIONAL SIGNIFICANCE OF THESE FACTS. To sum up these matters, we may say that Berkeley is growing rapidly, that racially it is rather homogenous in comparison with other cities, and that in occupations it has a leaning toward vocations that require large intelligence and training. These facts are clearly reflected in a low percentage of illiteracy. In general Berkeley is as yet primarily a residence community, and, even allowing for

TABLE V
STATISTICS OF ILLITERACY
(Data for Albany not available)

Locality	No.	%
San Francisco.....1900	8,960	3.1
1910	7,697	2.1
1920	8,520	1.9
Oakland.....1900	1,614	2.9
1910	3,863	3.0
1920	4,638	2.5
Alameda.....1900	No data	
1910	216	1.1
1920	319	1.3
Richmond.....1900	No data	
1910	82	1.5
1920	409	3.0
BERKELEY.....1900	No data	
1910	475	1.4
1920	497	1.0
Cos. Terr.....1900	.....	...
1910	12,333	2.2
1920	14,383	2.0
State.....1900	58,959	4.8
1910	74,902	3.7
1920	95,592	3.3
Alameda County.....1900	4,958	6.7
1910	7,381	3.6
1920	8,505	2.9

a normal development of the industries now established along the bay, it will continue in this class.

Interpreting these facts for education, we may say that Berkeley must expect a relatively large demand for public schools. Merely an average amount of schooling will never satisfy the people of this city. In such a city more of the children tend to stay in the school, and they tend to go to school for a longer time. This, with the high rate of growth of population, means that the demand for school buildings will be above rather than below the expectancy for an average city of this size.

The racial composition of the population, the occupations they follow, and the low percentage of illiteracy suggest that Berkeley will have relatively small requirement for special types of school plant, and relatively small demand for special technical and continuation training. This does not mean that these needs do not exist, but only that they are not outstanding as they are in many other cities. All these problems exist in some measure and they will gradually become larger and must not be overlooked.

The general principle that underlies all this discussion is, that the type of school plant required is to be determined in the light of the needs of the people. The school plant that is well suited to the needs of a community where the streets are wide, where traffic is light, where home sites and homes are large and families small, and where most families have automobiles and good incomes is not the type required by a community where the streets are noisy, heavy traffic lanes, where homes are small and families large, and where there is little leisure time for parents. A school auditorium, suitable club rooms, and a large playground are twice as important in the latter type of community.

Berkeley is now at a point where its first school buildings have to be replaced, and, where replacements are beginning to be urgently needed. There is at the same time the beginning of this latter type of school needs. While as yet no part of the city is densely settled, the tendencies in West Berkeley are clearly in this direction and will continue as industries push the residences eastward. In its program of rebuilding schools in this part of the city, Berkeley has an opportunity to demonstrate specialized service in school buildings. This does not mean fads and frills. It merely means that the school must recognize actual needs.

2. BERKELEY'S SCHOOL POPULATION.

AGE DISTRIBUTION OF POPULATION. Total population figures furnish a rough but not a perfect index to the size of the school population. There is rather wide variation in the age distribution of the people in different communities. In Table VI are presented certain facts from the Federal census reports by means of which Berkeley may be compared in this respect with other cities of the Bay region and Table VII shows similar facts for a group of western cities of Berkeley's class.

From Table VI it is clear that Berkeley differs not a little from other Bay cities. Berkeley has an average percentage of its children in the group under five years old but, in comparison with the state as a whole it is low. In five-to-fourteen-year-olds Berkeley

TABLE VI
PERCENTS OF AGE DISTRIBUTION
(Data for Richmond and Albany not available)

City	Under 5	5-14	15-19	20-24	25-44	45-64	65 and over
San Francisco							
1900	7.6	15.3	8.0	10.5	37.1	16.2	3.9
1910	7.0	12.0	7.8	11.2	40.9	16.5	3.8
1920	6.4	12.9	6.9	9.1	39.9	20.0	4.3
Oakland							
1900	7.9	17.6	9.2	9.8	31.7	17.8	5.0
1910	8.4	14.1	8.2	10.0	36.7	17.6	4.9
1920	7.6	15.1	6.8	8.3	37.0	19.8	5.2
Alameda		Data not available					
1900		23.6		43.2		25.0	
1910	7.6						
1920	8.4	16.3	6.9	7.5	34.5	20.3	5.9
BERKELEY		Data not available					
1900							
1910	8.0	14.7	9.5	10.5	34.1	18.2	4.9
1920	7.2	15.5	7.8	9.3	33.1	21.3	5.6
Cos. Terr.							
1900		20.8		49.9		21.2	
1910	7.4						
1920	7.2	13.8	6.9	8.8	38.4	20.1	4.7
State							
1900	8.5	17.7	8.6	9.2	33.0	17.0	5.2
1910	8.1	14.7	8.2	9.8	35.6	17.8	5.3
1920	8.0	15.7	7.1	8.0	34.6	20.3	5.8

Berkeley seems to be getting its share of the Eastern old people who come to California to retire.

is above the average for the Bay cities but slightly under the state average. In the next two groups, ages fifteen to nineteen, and twenty to twenty-four, Berkeley is well above the average of the Bay cities and also above the state average. In the group twenty-five to forty-four years old Berkeley is below the state average and far below the average of the Bay cities. Above these ages

Berkeley is not far from average except that it has more than its share of the old people of the Bay cities.

This table also shows what are the tendencies to change in these distributions. Apparently Berkeley follows the Bay cities generally, and also the state, in a slight decline in the percentage of small children, and in a definite increase in percentage of old people who fall in the retired class. The elementary school group, ages five to fourteen, is on the increase not only in Berkeley, but also in the Bay cities and in the state. Obviously this increase cannot continue unless the class below it maintains its position better than it has done in the past decade. All round the bay and throughout the state the high school age appears to be losing ground, as is the college group, in favor of people forty-five years old or older.

These facts indicate that Berkeley's population as a whole is growing faster than is its school population; that in proportion to total population, the elementary school group is increasing, while the high school and college groups are not; and that those living on accumulated capital are increasing faster than are those who are active earners. This does not mean that the school group is falling off in the absolute. Quite the reverse is true. It does mean that Berkeley is attracting relatively large numbers of old people who come here to retire.

When Table VII is examined we see that among western cities of its class, Berkeley holds better than a median position for children of elementary and high school ages, that it holds the very highest position for the group of about college age, and well above average for old people. In this table we see the same relative decline in the younger group; the same relative rise in the elementary school group; the same relative decline in the high school, college, and young adults groups; and the same relative increase in the two older groups. This seems to indicate that the birth rate suffered a slight decline during the war period.

These tendencies in population development are important from several standpoints, and quite as worthy of study by those interested in the business and commercial development as by those responsible for the educational interests of the city. Figure 1 brings these facts together in a way for easy comparison and helps to emphasize the above comments on Berkeley's position. This diagram shows for the Bay cities, for twelve western cities,

TABLE VII

PERCENTAGE OF AGE DISTRIBUTION IN WESTERN CITIES

City		— Years —						
		Under 5	5-14	15-19	20-24	25-44	45-64	65 and over
San Diego	1900			Data not available				
	1910	6.8	13.4	7.9	9.0	32.6	21.5	7.8
	1920	6.8	13.6	6.3	7.3	31.9	24.5	9.2
Sacramento	1900	7.2	15.5	8.5	10.3	36.5	16.1	4.6
	1910	6.9	12.0	8.1	10.9	40.7	16.9	4.2
	1920	7.8	14.9	7.2	8.6	36.8	19.9	4.8
San Jose	1900			Data not available				
	1910	7.7	14.4	8.8	9.3	33.4	19.3	6.7
	1920	7.6	16.9	7.9	7.9	30.5	21.3	7.3
Stockton	1900			Data not available				
	1910	6.3	19.5		46.7		25.8	
	1920	7.5	14.6	6.7	8.2	36.2	21.4	5.2
Pasadena	1900			Data not available				
	1910	6.7	13.6	7.8	8.3	32.9	22.1	8.4
	1920	6.0	13.3	6.3	8.6	30.6	26.2	10.7
Long Beach	1900			Data not available				
	1910	6.2	22.8		38.1		32.9	
	1920	5.8	13.1	6.5	7.0	30.2	26.4	10.9
Fresno	1900			Data not available				
	1910	10.0	24.8		45.1		20.1	
	1920	8.7	16.5	7.9	9.1	36.9	16.9	4.0
BERKELEY	1900			Data not available				
	1910	8.0	14.7	9.5	10.5	34.1	18.2	4.9
	1920	7.2	15.5	7.8	9.3	33.1	21.3	5.6
Salt Lake City	1900	12.3	22.4	9.9	9.3	28.7	12.9	3.8
	1910	11.3	18.3	9.5	10.8	32.7	13.5	3.3
	1920	10.8	19.9	8.8	9.2	31.5	15.6	4.0
Spokane	1900	8.2	16.7	7.5	9.6	42.6	13.2	1.0
	1910	8.7	14.5	8.2	11.6	38.9	15.1	2.6
	1920	8.0	16.9	8.1	8.3	33.8	20.2	4.6
Tacoma	1900	8.9	18.8	8.5	9.5	36.4	13.6	4.4
	1910	8.5	15.1	8.9	10.8	36.0	15.5	3.1
	1920	8.3	16.2	7.5	8.6	34.2	18.9	4.2
Ogden	1900			Data not available				
	1910	12.0	20.1	10.2	10.5	30.3	13.8	3.0
	1920	11.8	21.3	9.5	9.1	29.9	14.7	3.6

for California, and for the United States the percents of total populations between the ages of five and nineteen years. In Part I Berkeley's position among the Bay cities, the state, and the United States is shown and in Part II the twelve western cities and the United States are shown. From the figures for the United States as a whole it is clear that California, and in fact most of the western cities, are in this respect carrying a relatively light burden. It may be argued, however, that this is in part offset by a heavier than average burden of old people who have come west to retire and have ceased to take active part in the development of wealth.

THE NUMBERS ATTENDING SCHOOL. Such a study of age distribution furnishes an index to the size of Berkeley's school population as compared with that for other cities and in that way suggests the size of the burden of cost and the need for school buildings. Some children enter school before the age of 5 years and, for various reasons the children from 5 to 19 years of age are not all in the public schools. Some have not yet entered at the age of 5, while very large numbers have finished school and left. Others attend private or parochial schools and some are out because of illness, so that in this study of census children, we do not have a check on the actual demand for buildings; for this we need a study of the actual school enrollment.

In Table VIII are presented by years, and by school groups, the numbers enrolled at the end of the first school month of the year through the years 1918 to 1926. It was not possible to obtain entirely comparable figures for earlier years. Table XXVII in a later chapter will use state enrollment figures which are different from these but are available for a longer period. The reason for using the first month's enrollment here is that it represents about the largest number of pupils that has to be housed at any one time in the year.

From these figures it is clear that all the groups have had a healthy growth during these years; yet, grades 1 to 6 have increased by only 11.7 percent in the 7 years, while the total population increase was nearly 22 percent. The kindergarten and the junior and senior high schools vastly outran the total population, however, so that the actual rate of growth for all schools combined was 37.2 percent, or 7.5 percent more than that for the city's population.

TABLE VIII

TOTAL POPULATION AND SCHOOL ENROLLMENT FOR BERKELEY, 1918-1926

(Enrollment end of first month of year. Population as in Table I)

Year	Total Population	Enrollment in					Percent of Tot. Population in				
		Kinder- garten	Grades 1-6	Grades 7-9	Grades 10-12	Total	Kinder- garten	Grades			
								1-6	7-9	10-12	Total
1918-19	55,609	611	5,371	1,995	998	8,975	1.1	9.6	3.5	1.7	15.9
1919-20	57,295	603	5,347	2,211	1,163	9,324	1.1	9.3	3.8	2.0	16.2
1920-21	59,032	689	5,335	2,374	1,339	9,737	1.1	9.0	4.0	2.2	16.3
1921-22	60,769	659	5,421	2,663	1,465	10,208	1.1	8.9	4.3	2.4	16.7
1922-23	62,506	667	5,611	2,791	1,737	10,806	1.1	8.9	4.4	2.7	17.1
1923-24	64,243	769	5,741	2,941	1,997	11,448	1.2	8.9	4.5	3.1	17.7
1924-25	65,980	792	5,895	3,097	2,125	11,909	1.2	8.9	4.5	3.2	17.8
1925-26	67,717	793	6,001	3,153	2,368	12,315	1.2	8.8	4.8	3.5	18.2
% Increase	21.7	29.7	11.7	58.0	137.2	37.2					
Average							1.125	9.04	4.13	2.6	16.99

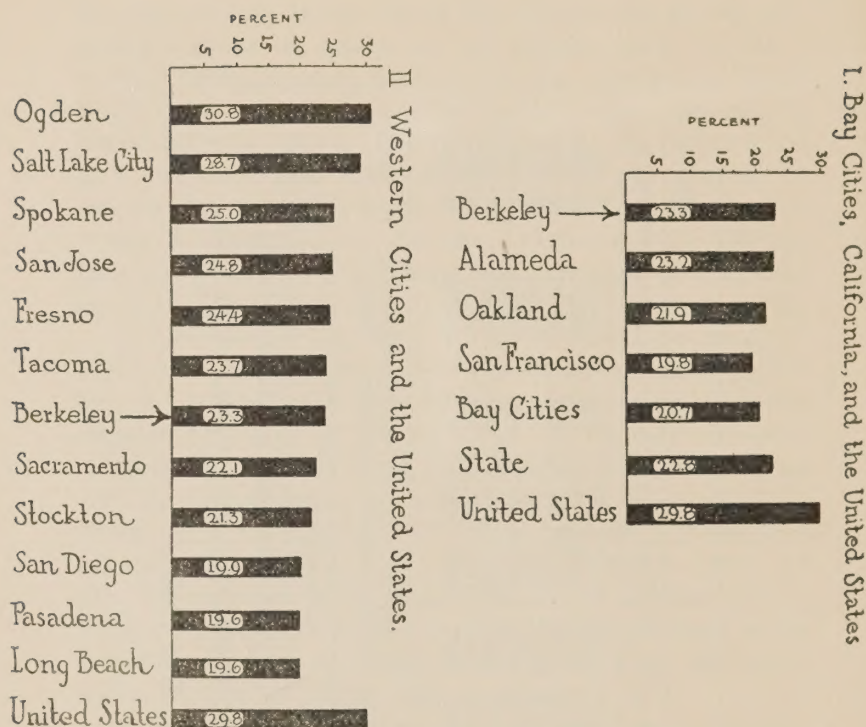


Figure 1

Percentage of population between the ages of 5 and 19 years (1920 census), Bay cities, Western cities, California, and the United States.

In Table VII we saw that in 1920 the group of children 5 to 19 years old included 23.3 percent of the total population. In Table VIII is given the ratio of the actual school to the total population by years for each of the school groups. From these figures the rate of increase in the elementary group, and the rates of gain in all the other groups become quite clear. Referring to the final column of the table, we see that the actual school population included 16.3 percent of the total population in 1920 and from 15.9 to 18.2 percent during the period covered by this table.

These figures make clear that the relative as well as absolute demand for school buildings in Berkeley is on the increase; and that the rate of increase is greater than that by which the city is growing. We may remind ourselves in passing, too, that these figures have important financial implications.

We might reasonably expect that the growth of the kinder-

garten and of the junior and senior high school groups would have been more rapid than was that of the elementary school group. Just why the rate of growth of the elementary school group should fall behind that for total population is not so easy to understand, except by the fact noted above, that this age group in Berkeley is not quite holding its own, due in part at least, to the rapid increase in the percentage of old people who come to Berkeley.² We might reasonably assume that the elementary school group has reached the point at which its rate of growth will never again surpass that of the total population. This will likely be true of the junior high school group very soon, though we may expect the high school rate to remain relatively high for some years. The reason is that the compulsory attendance law is becoming more effective each year and high school training is becoming more popular with the young people. These two facts may be expected to offset the statement above that the high school age group is not growing as fast as is the total population.

3. BERKELEY'S PRESENT PLAN OF EDUCATION.

Above has been presented an analysis of the factors that determine Berkeley's needs for schools while no attempt has been made to refine these studies as would be necessary in a complete survey of all aspects of the school system; yet, enough facts were shown to indicate the general character of the scheme of instruction that must be maintained. Our next question is: Are these needs being met by the schools at the present time? If so, then we may judge the buildings with reference to the schools as they are. If not, then the question is: What revisions in the school program are needed?

It is not the function of a survey of this character to make an exhaustive study of the results of instruction. It must examine the school machinery and program and the main aspects of the school procedure since the efficiency of the present plant and the needs for revision can only be fairly studied in their relation to the school work going on inside the plant.

Berkeley covers an area of about 10½ square miles and in shape the city is approximately square with a small projection northward of the northeast quarter of the city. There are ap-

² The State University in no small way accounts for the relatively large number of older people.

proximately 10,000 children to provide for in regular full-time day schools, and some 3500 who attend part-time and evening schools. In immediate charge of these children, Berkeley has a staff of 25 principals and 475 teachers. Above this group there is an administrative and supervisory force devoted to the task of planning, coordinating, and directing the work of the schools.

Berkeley's plan of instruction includes the kindergarten and 12 years beyond, and the organization is what is commonly designated as the 6-3-3 plan. The system as it now operates is shown schematically in Figure 2. It provides for 13½ years of training between the ages of 4½ and 18 years. The first year and a half are devoted to kindergarten, above which is an elementary school of six grades or years, followed by the junior high school of 3 years, and at the top of the system, a senior high-school of 3 years. Figure 2 shows the plan in terms of the actual building units, the years covered, the grades covered, and indicates the route over which a child travels through the school system. The number of buildings for each school, the number of rooms, and the January, 1926, enrollment figures are added in order to indicate the size of each of the school plants and of each of the administrative units of the system.

Berkeley has the honor of having originated this plan of organization, and now has what is probably as clear and full an expression of this general theory of school organization as is to be found. This is a distinct achievement, and must be recognized as a genuine contribution to education in this country. As a form of organization the system needs no commendation here. The idea is now very generally accepted throughout the country as sound, and the more recent building programs are most everywhere recognizing its merits.

In practice this plan is now in full operation in Berkeley and at present there are no serious hindrances in the form of permanent old buildings that stand in the way of its proper development. In this Berkeley is more fortunate by far than most cities. This does not mean, however, that Berkeley has an ideal plant arrangement for housing this plan of instruction. It very obviously has not, as will appear in more detail elsewhere in this report.

At this point we desire to focus attention upon just two considerations. First, the plan of instruction. Second, the operation of the plan.

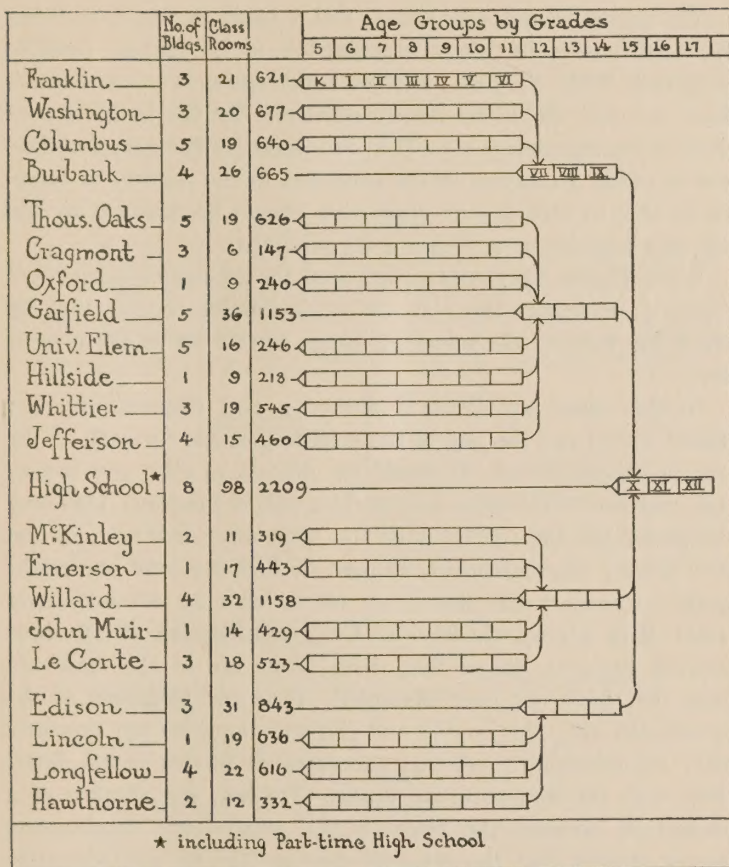


Figure 2
Berkeley's plan of instruction and plant arrangement.

So far as the writer has observed, and he has examined many facts that do not appear in this report, Berkeley's plan of instruction is thoroughly sound and fully abreast with the best educational thought in the country. Further, this plan is now operating with excellent effect in Berkeley. It has some handicaps, but these are such as would operate in one type of organization as much as they would in another. Berkeley's method of grouping children recognizes psychological, social, and educational facts about children which, in the writer's judgment, are not so well recognized in other plans.

The people of this city should feel a pride in trying to bring this contribution in school organization to its highest possible perfection. While the plan has some handicaps as it is now housed, these can and should be largely overcome by the building program of the next ten years. This, in a sense, is Berkeley's obligation to public education in the state and in the country at large. To be able to furnish such leadership should be regarded by the city as a high honor and as a great privilege.

While Figure 2 presents a picture of the scheme of instruction, Figure 3 represents the plan of administrative organization by which the work of the schools is being carried on at the present time.

In this chart the lines of authority and responsibility are clearly traced and the size of the staff responsible for each of the functions is indicated. It would be difficult to offer any important criticism of this plan as a working school machine. One may not prefer the term director or the term office manager, or the term deputy superintendent, as used in Berkeley, and one might prefer to connect the attendance officer with an administrative rather than a research service. Close examination of all these matters, however, shows that these terms are in the main old titles that have not been discarded. It is the judgment of the commission that the service and the coordinations are precisely what are necessary, and that the research service is not interfered with by administrative duties. Further, the absence of a connection between the research and supervisory departments merely implies that the research director has no administrative responsibility in connection with the supervision of the instruction. This is as it should be, since it makes possible an unbiased attitude and an unhindered procedure in the search for the facts upon which school policies must be based.

It is decidedly stimulating to hear the discussions that are carried on in conferences by the superintendent, the director of research, the supervisors, the principals of the schools, and groups of teachers in which the results of observations and studies are being brought to bear upon the instruction of Berkeley's children. As to the value of such work there can be no doubt. Through some contact with this work, through many visits to class rooms, through an examination of the courses of study, through a study of the school room equipment, through records and through many

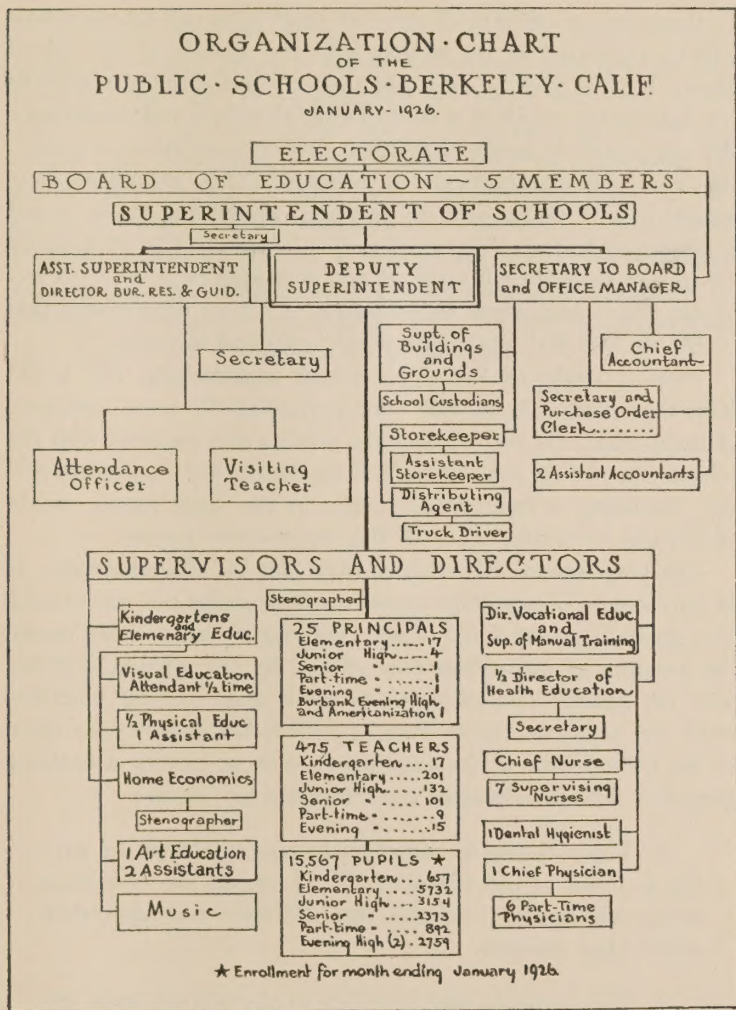


Figure 3

Organization chart of the public schools, Berkeley, California.

less tangible contacts with the schools the writer is convinced that this machine is functioning with excellent effect.

Comment on the size of this staff, and upon the school groups will be presented in connection with the studies of the school plant. Here it may be said that there are no absolute standards for judging the worth of a staff of administrators and supervisors. We must judge in terms of accepted principles of school organization and administration, and in terms of actual results as these appear in such places as were suggested above, and in the actual achievement of the children. Yet, this is equally true in business affairs. In general both business and education have come to recognize that money spent on leadership is a type of overhead that is fully in line with principles of efficiency and economy.

From a study of Berkeley's school organization, one would infer that stress is being laid upon perfecting the actual processes of instruction. On the basis of the studies and contacts with the schools above mentioned there is little doubt that a complete survey, including a measure of results in the class rooms, would reveal the favorable effect of this supervisory service.

The purposes of this chapter must not be misunderstood. It is not offering a complete survey of instruction nor an exhaustive study of instructional needs. This survey must either accept the program of instruction now offered by the schools, together with the general plan of execution, or it must propose modifications and revisions. Some plan of instruction must be set down as the embodiment of the practical ends to be met by a building program. The principles of procedure are as follows:

1. The purposes of education for any city must be written in terms of the character of the people, the conditions under which they live, and the traditions and aspirations which they treasure.

2. The curricula and activities of the schools must recognize these factors as they bear upon the immediate and also the remoter needs of the children, of the parents, of community life, and of a democratic state.

3. The school organization and also the school plant must be designed with reference to these same factors as they are reflected in the aims of the curricula and in the

social and psychological principles with reference to which the processes of instruction must be carried on.

Above we have set forth the main facts in terms of which Berkeley's school program should be worked out, and we have described the plan of organization by which the work of the schools is carried out. In the light of these facts the writer concludes that Berkeley's present school objectives, program, and policy have recognized the above principles very fully as they apply to aims, curricula, construction, and staff organization. It remains to show whether or not the present school plant in Berkeley has helped or handicapped the attainment of these aims or the working of this school machinery. To a full answer of this question Chapter III, following, will be devoted.

CHAPTER III

ADEQUACY OF THE PRESENT SCHOOL PLANT

I. HOW TO DETERMINE THE EFFICIENCY OF A SCHOOL PLANT.

In the above chapter we have been concerned with two sets of facts: first, facts through which we might discover the educational needs of the city—their character, extent, and tendencies; and second, facts by which we might judge the quality of the present plan of instruction and the effectiveness of the machinery by which that plan is being carried out. In the light of these needs, and of the requirements of the system as operating, we shall now attempt to evaluate the present school plant. We start with the conclusion arrived at above, viz., that the present educational policies are sound and well adapted in objectives and procedure to the needs of the children. Here we shall consider whether the present school plant is well or ill-adapted to the purposes it should serve.

METHOD OF MEASUREMENT. The question of how to determine the efficiency of a school plant is of both economic and educational importance. In the United States as a whole our public school properties are valued at approximately \$4,000,000,000. In California we have \$240,000,000 invested in school buildings and equipment, and Berkeley's school plant is valued at \$4,081,814. From an investment standpoint alone, we need to understand the rate of depreciation on these properties and how properly to maintain them.

As noted above, depreciation may be due to obsolescence as well as to wear and tear. Accordingly we should try to find some way to measure amounts of obsolescence. It is poor economy to employ a high class staff of teachers and develop a first class plan of education, and then house it all in an obsolete plant that materially reduces the value of the service.

Here we shall deal with this question of evaluating the school plant in the following ways:

First, the plant as a whole—the number, character, and placement of buildings—viewed from the standpoint of good educational organization and economic management.

Second, the school plants individually—their rating, when judged by quantitative methods.

Third, the adequacy of school grounds as judged by their adaptability for use in carrying out a reasonably modern physical training program.

The methods used will be in part descriptive and qualitative and in part quantitative. There are certain well established principles of organization and administration that are applicable in education as they are in business and in public institutions generally. Corresponding to these, also, are certain educational principles which are equally well established. By describing Berkeley's buildings, and by checking them in terms of these principles we shall be able to bring to light any weakness that is at all fundamental in its bearing. These general findings will then be followed by the use in more detail of a well-established scheme of measurement.

SOME GUIDING PRINCIPLES. At the outset we may set down some of the principles that are to be applied as a partial test of plant efficiency. As already stated, a school plant is a very intimate and, in no small sense, controlling feature of a system of education. A building must be constructed with careful reference to aims and plan of instruction as set up by the superintendent, with the assistance of his principals and teachers. An architect, an engineer, and a builder have a part also, but only in solving other than educational problems. The control is always the educational purpose, a purpose set up in the form of an actual plan of instruction for a given number of children. This control should never leave the hands of the school superintendent or an educational expert serving for the superintendent. It begins with the selection of a site, and it ends with the final acceptance of the completed building.

A school building should be located and constructed with regard for the following considerations:

1. *Educational Purpose.* In the matter of educational needs we should, in general, get as homogenous a group of children as possible. This does not mean perfect homogeneity. It applies only to such social, intellectual, and

physical factors as are so pronounced as seriously to affect the instruction.¹

2. *Accessibility to Children.* The distance should rarely exceed three-quarters of a mile for elementary school children, a mile for junior high school children, and a mile and a half for senior high school children. The factor of distance, however, is modified in two ways. Convenient means of conveyance may lessen distances, while hills or difficult streets may have the effect of increasing it.

3. *Attendance Barriers.* As often as possible, heavy traffic lanes should be made the dividing lines between schools.

4. *Population Center.* The school should be reasonably near the population center of the community served. With small districts, this is of less importance.

5. *Size of Group.* The population served should provide a group that is large enough to make for educational efficiency in classification, curricula, and social activities in school and community.

6. *The Cost Factor.* The school should be large enough so that overhead costs will not be unduly high. Small classes, and few classes mean high costs.

OTHER MEASUREMENTS. The score card method for measuring the buildings, also a newly devised plan for measuring the adequacy of play space will be explained later in connection with their use.

2. GENERAL CHARACTERIZATION OF THE SCHOOL PLANT.

THE AGE OF BERKELEY'S SCHOOL BUILDINGS. Berkeley's school plant is fairly well characterized by Table IX in which is listed for each school the date on which the main building was erected, the number of class rooms provided in each separate building, and the character of the heating system.

¹ In a public school we can never separate children of different races or different social groups because one is regarded as too good to associate with the other. On the other hand, it is wrong not to classify children in a way that will give the best educational service. This means that for strictly educational reasons, we must have reasonable homogeneity in school groups.

TABLE IX
BERKELEY SCHOOL BUILDINGS
CHARACTERIZED

[illegible]

Of the 17 elementary schools, counting Hillside, authorized, and Cragmont, in process of construction, we may say that nine are totally or partly housed in modern plants. Most of the other 8 are in poor or very poor plants. Regarding the main buildings:

2 are 17 years old	1 is under construction
2 are 10 years old	3 are 34 years old
1 is 8 years old	1 is 31 years old
1 is 5 years old	1 is 30 years old
1 is 4 years old	3 are 20 years old
1 is authorized	

THE OLD AND NEW IN SCHOOL BUILDINGS. As compared with older cities, Berkeley's buildings are not ancient, yet this tabulation of ages reminds us that many of these elementary buildings were erected before the following items were regarded as essential parts of a scheme of public instruction:

1. Auditorium—for constant use in instruction and for community meeting place.
2. Domestic science or home making and management.
3. Health inspection and supervision.
4. Visual instruction.
5. Shop work for boys.
6. Library service.
7. Gymnasium and large playgrounds for organized play and physical training.
8. Specially equipped room for nature study and geography.
9. Preparation and serving of lunch at noon.
10. Music and art work requiring special equipment and rooms.
11. School as a community center.
12. Parent-Teachers' Association.
13. The kindergarten.
14. New type of administrative offices.
15. Research and guidance.

Take these things out of the schools today and we have left the school program of twenty-five years ago and practically the program that served a century ago when we were all country dwellers and the ox-cart, the scythe, and the flail were in use. With machinery came city life and we passed into a new age, and this list of items is the school's response to this new age.

Whoever classes these items as "fads and frills" is thinking of the schools of a time that is long gone by. This is the school of the present century. We can now no more accept the old school of three R's, with its falacious conception of education as discipline, than we can accept the push cart methods in merchandising, or the hand method of preparing our food, our clothes, and our homes. A candle light school in an electric light age of business and trades and industry and social intercourse would be an absurd and intolerable inconsistency.

We know that this new type of school costs more than did the old but so does the electric light cost many times more than did the old candles. And, just as we have more money for other things than we used to have, so we must expect to have more money for schools.

BERKELEY'S CONCEPTION OF EDUCATION. Berkeley's schools long ago caught the spirit of this new civilization. Signs of this are abundant in organization, in curricula, in management, in classroom equipment, and in playgrounds. But it has not been easy to change the old-time buildings, where the school was mainly a teacher, a book, and a group of children, to a suitable home for the richer program of today. Yet, we find these programs in every school in Berkeley, making good against odds that would reduce the average business or industry to bankruptcy. If the truth were known, we should likely need to add that some of the schools are losing no small part of the worth of their present efforts because the buildings are so ill-adapted to this modern program.

TOO MANY TEMPORARY BUILDINGS. Table IX shows how the city has tried to meet this problem—a problem made doubly hard by a rapidly growing population. Some alterations have been made in old buildings but, all too frequently, a new and separate one or two or three-room temporary unit has been added. Of these "annexes" there seems no end. On the playgrounds of the 17 elementary schools, 45 of these temporary structures have been added. The loss in needed play space alone is more than enough to condemn such a wholesale use of this kind of makeshift. These cottages are often badly placed on the grounds, making for general inconvenience in school management and for unsightliness in appearance. Many of them are cold in winter and very hot in summer. Were it not for these objections, it could be said that a

few have made very pleasant class rooms. It is to be hoped that the policy of doing away with these may be entered upon at once. Perhaps such buildings will always meet a need in a growing city, but they should never dominate a school system as they are now doing in Berkeley.

This criticism applies in some measure also to the 6 junior and senior high and part-time schools. The junior high schools are utilizing a total of 16 buildings and the heating systems are good and poor. The senior high and the part-time schools have a total of 13 buildings. In all, these 6 schools have 10 substantial buildings and 19 temporary or old buildings or shacks that have been used to carry the overflow of students.

As a general policy for the whole system these poor substitutes for a real school home ought to be discarded. It is doubtful whether such buildings are as inexpensive as they appear. They provide poor housing, and surely they do not adorn the city.

TOO MANY ELEMENTARY SCHOOLS. Before proceeding to a closer view of these buildings there is one other point of importance to consider. In the ten or eleven square miles of the school district, a district that is nearly square and that is not densely populated, there are 17 separate elementary schools. Figure 4 shows a map of the district, the boundaries of which are coterminous with those of the city. On this map the locations of all schools are indicated by stars. Small stars mark the locations of elementary schools, medium sized stars indicate junior high schools, while the large star in the center marks the location of the senior high school and the part-time school.

This map is also designed to show the present zoning plan of the city. The industrial center, the business and commercial areas, and the restricted and unrestricted dwelling sections are clearly designated. Along with these features is shown most of the thoroughfares that are of such a character as to require attention when the city is being districted for the placement of school attendance lines.

From the location of the stars it will be seen that it is not possible to make these streets the boundary lines between districts. That they have had some effect in determining the location of the schools, however, is obvious.

About each of the small stars a circle with a half-mile radius has been drawn. Because of the many busy traffic lanes through

CITY OF BERKELEY CALIFORNIA

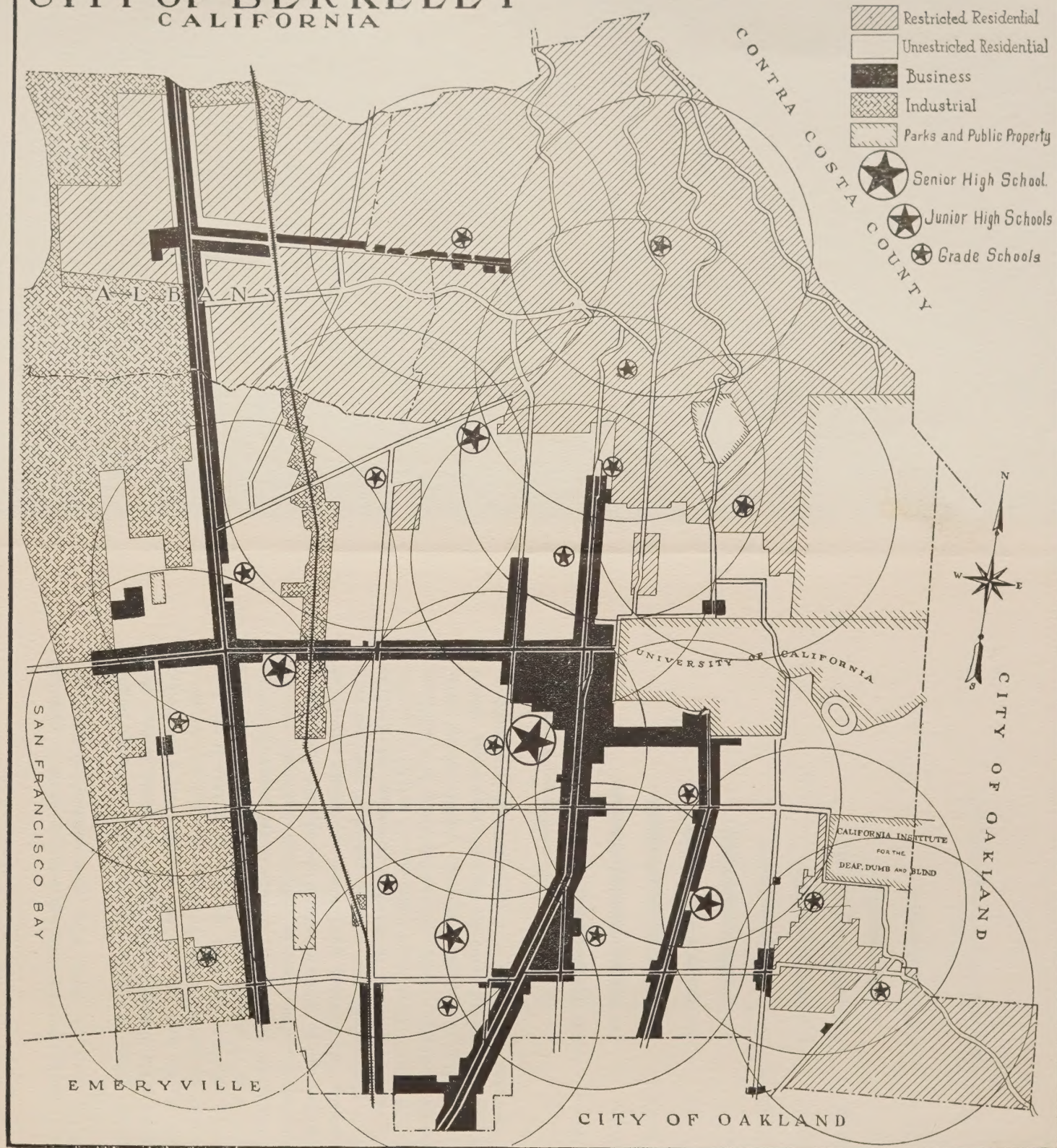


Figure 4

City of Berkeley, showing location of schools, size of districts, the main thoroughfares, and the present zoning arrangement.

the city it would seem that a half-mile radius should be regarded in Berkeley as a maximum rather than minimum standard for size of district.

A casual glance at this map shows one of the really serious weaknesses of the Berkeley school system. It would be very conservative to say that the city has one-third more elementary schools than are needed. If the buildings were properly located 9 elementary schools would serve the city better than it can now be served with 17 schools. Such a number would not only give better educational service, but it would cost less money to operate. It can be seen at a glance that the Oxford and University Elementary schools could be removed without the slightest derangement of the system. The Emerson and LeConte are equally superfluous and, if the other schools were properly placed at least two more could be done away with. In reality, considering the distances and the population, if one could begin anew it would be possible to house the elementary schools very satisfactorily in 9 buildings.

With 9 in place of 17 separate schools a slightly smaller teaching and supervisory force could do the work even better than it is now done and the number of principals would be reduced ac-

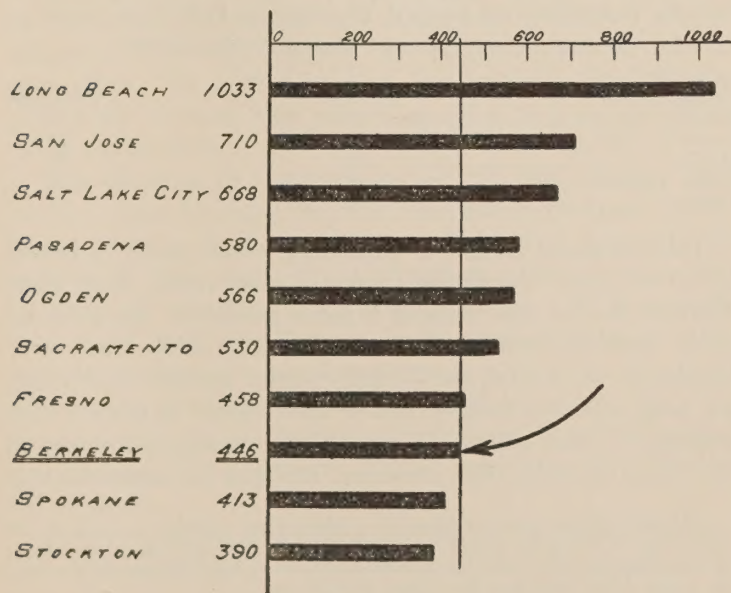


Figure 5
Number of pupils per principal employed.

cordingly. For principal's service Berkeley is now paying from \$4.63 per pupil in one elementary school to \$14.44 in another.

Berkeley's expensive position is made further evident by comparison with other cities as in Figure 5, which shows for 10 cities the number of pupils per principal. This covers all schools. If it referred to elementary schools alone Berkeley would be at still further disadvantage.

At present the research bureau gathers data and shows how each child can best be classified. The supervisor takes these data, goes to a school, and tries to effect this desirable classification. In the second grade, for instance, she finds in some school a total of 46 pupils. The research department has shown that these 46 pupils should be taught in three separate groups. If there were 90 or 100 children in place of 46 this could be done. With 46 it cannot be done and the best substitute possible is not a good solution. The result is that half the value of the research and supervision go to waste. The teacher works twice as hard, and accomplishes far less than she could otherwise accomplish.

TABLE X

SIZE OF ELEMENTARY SCHOOL CLASSES IN BERKELEY AND IN
129 CITIES OF 25,000 TO 100,000 POPULATION²

Case for Comparison ¹	Berkeley	129 Cities
Smallest	15	20
Lower Quartile	29	33
Median	33	35
Upper Quartile	36	40
Largest	44	45

Table X shows the size of elementary school classes in Berkeley as compared with similar classes in other cities. From these figures it is clear that Berkeley is below normal for this group of cities. Berkeley's median class is only as large as the lower quartile class in other cities, and Berkeley's upper quartile class is only one larger than the median class in other cities.¹ It is more than doubtful if these differences are evidence of superior service in Berkeley. Granting this, however, the cost is unquestionably

¹ If the classes were arranged in a series from smallest to largest the middle one in the series would be called median. Half way from the middle to the lower end gives the lower quartile case and half way from the middle to the upper end gives the upper quartile case.

² Data are from Bulletin One of the Research Department of the National Education Association, June, 1922.

higher. Berkeley is well equipped to work out the best possible system of classifying children but, because of small schools, is prevented from making the best use of this service, except at the cost of extremely small classes. The surprise is that Berkeley has been able to keep classes as large as they are. This has been accomplished at the cost of less than the best in classification of children.

This should not be interpreted as advocating exceptionally large classes. Berkeley's largest is quite large enough. Further, it is proper to add that Berkeley's few very small classes represent an excellent refinement in classification. However, larger schools would make possible far fewer classes of 20 to 29 children.

There is yet one other objection to these small schools in Berkeley. The schools are competing (unconsciously, perhaps) for children, and each school is demanding its rightful "place in the sun." Whether small schools are the cause or the result of small neighborhood life it is not necessary to say. In any case, provincialism is the net result that Berkeley is getting. While it would be difficult to prove, it is none the less obvious that these small schools are the nuclei of antagonisms that are detrimental to the welfare of education and to a proper social and political solidarity in the city. We need not bother with how all this has come about. The spirit back of it does not make great cities or good school systems. One way to get rid of it is to have larger school communities.

THE PROBLEM OF REORGANIZATION. To sum up these comments, it must be urged that any constructive proposals for the future housing of elementary instruction must recognize the necessity of doing away with small schools. The reasons as here set forth are educational, economic, and social. It is perfectly clear that a small school cannot render as good service as can a large one, except at a much larger cost, if it can at all. Small schools must inevitably mean high cost and poor instruction. The present small schools stimulate a small neighborhood as opposed to a city viewpoint in matters affecting social and civic as well as school affairs.

It may be argued that growing density of population will overcome this weakness. One only has to consult the school enrollment statistics of past years to see the fallacy of this argument. In 8 of the 17 elementary schools the enrollment figures were

smaller in December, 1925, than they were in December, 1924. The point is that new schools have been added before the population increase warranted it. Even if growth in density of population should ever cause the schools to become too large, it surely is not good economy to build for that distant future now.

HIGH SCHOOLS CONSTRUCTED ON SOUND PRINCIPLE. This criticism does not apply either to junior or senior high schools. The four junior high schools are well located, as are also the senior high school and the part-time school. These buildings are close to the center of the population groups served and, aside from the part-time school, proper expansions of these plants should be able to take care of the growth of five or six years more before any division of these groups is needed.

In all these high schools we can see the effect of the principle of centralization, or of large groups of pupils. In Table XI are presented figures showing the size of classes in 19 California high schools, each having over 1000 pupils, in Phoenix, Arizona, Union high school, and in Berkeley high and junior high schools. From these figures it will be seen that Berkeley is able to organize relatively large high school classes. The obvious results are better classification of pupils, and economy in cost. For service of principals these schools pay but \$2.10 per pupil in the senior high school, and from \$3.25 to \$5.91 per pupil in the junior high schools. This is a substantial contrast with similar costs in elementary schools.

It is to be kept in mind here that this survey is interested in these problems of organization only because they have a direct bearing upon what should be recommended in the matter of a future building policy to be set forth in Chapter VI of this report. At this point attention is called to the fact that Berkeley has carried decentralization to a wasteful extreme in organizing elementary schools, and at the same time has pursued a sound policy in properly centralizing the high school groups. In Chapter VI it will be recommended that the elementary school policy in this matter be reversed as far as possible, and that the present high school plan be adhered to. How the former is to be effected will be set forth in Chapter VI.

TYPES OF SCHOOL BUILDING CONSTRUCTION IN BERKELEY. Berkeley began with all wood construction for school buildings

and now has in addition to this type, a wood structure with stucco, brick, and concrete. The oldest buildings are of wood. They were in the main well built and have had good care. Wood is of course not fire proof and maintenance costs are relatively high. Except for appearance, Berkeley's stucco buildings are a doubtful improvement over wood. In durability, and in maintenance costs

TABLE XI

Case	Size of Classes in High Schools					
	19 Calif. Cities ¹	Phoenix, Ariz. ²	Berkeley High ³	Junior High ³		
				Willard	Edison	Garfield
Smallest		3	4	7	9	6
1st Quartile.....		18	22	21	19	18
Median	26.5	23	27	29	27	27
2nd Quartile		25	32	39	33	39
Largest		67	55	61	53	83

they have shown no advantage. Further, they are only a little better in fire risk than is all wood construction. The brick buildings in Berkeley are an improvement in fire risk and durability, and very satisfactory in appearance. In the judgment of the survey commission the added cost is warranted provided the internal construction is properly organized and sufficiently elastic. The concrete building corresponds to the brick in the matter of durability and fire risk, though it is much less elastic where remodeling is required in later years.

3. THE PRESENT PLANT AS JUDGED BY SCORE CARD MEASUREMENTS

THE SCORE CARD METHOD OF ESTIMATING VALUES. A score card is a device by means of which definite values may be assigned to the quality or the quantity of the thing being measured. It is a simple measuring stick by the use of which it is possible to state values in quantitative terms. As applied in the measurement of school buildings, it is of great value since there are many aspects of a school plant to which no other type of measuring instrument can be applied. As a yard stick stands for a given

¹ From Report of the Committee of Fifteen, California High School Teachers' Association.

² From an unpublished report of Phoenix, Arizona, Union High School Survey, 1924.

³ Including all classes except those in physical education.

amount of distance, a degree for a given amount of temperature, a pound for a given amount of weight, and a dollar for a given amount of money value, so the scores on a score card stand for given amounts of value in a school building.¹

The score card used in this survey is that devised by Drs. Strayer and Engelhardt, the plan of which is as follows: A perfect, that is, a very superior plant, is given a score of 1000. A plant that is so poor and inadequate that it cannot be repaired and made usable except at an unreasonable cost is given a score of from 0 to 500. A building that receives a score of 500 or above is supposed to have at least some value. For purposes of scoring the plant is divided into five parts, as follows: Site, building, service system, class rooms, and special rooms. In a highly satisfactory plant these divisions receive scores of 125, 165, 280, 290, and 140, respectively, together totaling 1000. On the card each of these parts and each of these scores is further subdivided so that by a proper use of the plan a building receives a very thorough examination in terms of carefully prepared standards. It may be added that the standards embodied in this score card have come to be generally accepted over the country and, even though the measurements may not be as objective and as refined as those made by a yard stick, yet there is a substantial agreement of results when two or more people score a building independently by use of this card. The authors of this score card obtained the following scores on the same buildings from three independent scorers: On one building the scores were 580, 571, and 551; on another building they were 561, 568, and 549. From these scores it is clear that the plan is quite defensible as an objective scheme of measurement.

THE SCORING OF BERKELEY'S BUILDINGS. In this survey this plan of measurement was applied to 15 elementary and to 4 junior high school plants in Berkeley. The temporary plant at Cragmont was not included for the reason that it is obviously useless and must be replaced at once.² The high school plant has one permanent building, one or two that will render service for a short time, and a considerable number that would probably not

¹ For a concise explanation of the Strayer-Engelhardt score card see *Standards for Elementary School Buildings*. Bureau of Publications, Teachers' College, Columbia University, N. Y., N. Y.

² Action on this has already been taken by the Board of Education.

score 400 and that ought to be used no longer. What is needed at the high school seemed reasonably obvious without such scoring.

The twenty buildings were scored by Professor John Almack of Stanford University and Mr. Andrew S. Hill, member of the survey staff and Assistant Superintendent of Schools of San Jose, California. On ten of the elementary buildings the two worked independently and prepared separate scores. In all cases the two were in such close agreement that it seemed an unnecessary amount of labor to carry out the double scoring through all the buildings. The ten schools scored by the two with scores assigned were:

Columbus: 455, 493.

Le Conte: 560, 606.

Jefferson: 728, 773.

Oxford: 707, 713.

Washington: 628, 649.

Lincoln: 850, 880.

Thousand Oaks: 684, 723.

John Muir: 762, 759.

Emerson: 653, 667.

Whittier: 558, 588.

In the subdivisions of the scores a satisfactory agreement was lacking in only a few instances and these were easily adjusted. It is clear that these scores were made with care and that any recommendations suited to one of these scores would apply quite fully to the other. The writer is convinced from this agreement of scores, and from his own intimate observations and studies of the buildings that the following scores reflect very accurately the present status of Berkeley's school buildings and that any competent judge would arrive at very similar conclusions.

In applying this measure to the Berkeley schools one important difficulty had to be faced. In many cases the plant consists of one new building and one or more old ones. Instead of scoring each of these buildings separately and then combining the scores, it was decided to treat the extra buildings on the grounds as part of the school plant and to credit the school with whatever contribution these extra temporary cottages provided as supplementing the main structure. This probably makes the scores a trifle higher than they would be had the plant been penalized for having its class rooms scattered about. In spite of this difficulty, it is clear that two men scoring independently came to much the same conclusions as to the worth of the buildings.

SCORES ON ELEMENTARY SCHOOL PLANTS. In Table XII are presented for 15 elementary schools the total scores and the scores of the five main subdivisions of the plants. The buildings are ranked on the basis of total score so that from the second column it may be seen how these 15 schools compare when this plan of evaluation is applied. The Lincoln school is clearly the best plant. Its score is not much affected by old structures as is the Longfellow, which otherwise would score next to the Lincoln.

TABLE XII

SCORES OF ELEMENTARY SCHOOL BUILDINGS

(Maximum scores possible and actual scores obtained)

School	Rank on Total Score	I Site	II Build- ing	III Service System	IV Class Rooms	V Special Rooms	Total Score
Lincoln.....	1	112	151	215	281	106	865
Univ. El.....	2	103	86	189	251	82	799
Longfellow.....	3	112	137	171	269	76	765
John Muir.....	4	113	133	174	260	81	761
Jefferson.....	5	115	116	175	256	88	750
Oxford.....	6	111	128	159	249	60	707
Thousand Oaks....	7	104	119	157	248	76	704
McKinley.....	8	103	103	147	235	76	664
Emerson.....	9	98	111	156	226	69	660
Washington.....	10	91	120	116	225	86	639
LeConte.....	11	104	106	128	178	67	583
Whittier.....	12	96	104	115	206	54	575
Franklin.....	13	100	84	88	212	27	507
Hawthorne.....	14	51	86	121	197	38	493
Columbus.....	15	81	85	75	188	48	477
	(Perfect Score)	125	165	280	290	140	1000

From this table it will be seen that the 15 schools range in scores from 865 down to 477. The former is a good score and if the building is completed along proper lines the Lincoln will be a high class building. The latter is a very poor score, as are the 2 next above it. The Columbus and Hawthorne buildings are regarded as entirely unfit for further service and it is recommended that these be abandoned at an early date. Further, Franklin, Le Conte, and Whittier are only very slightly better.

At the foot of the columns in this table are shown the highest score any building may receive for each of the five main features. *Site* here has reference to location, drainage, size, and form. *Building* includes placement, gross structure, and internal structure. *Service systems* includes facilities for heating, ventilation, fire protection, cleaning, artificial lighting, electric service, such as clock, gongs, and telephone, water supply, and toilets. *Classrooms* includes location and connection, construction and finish, illumination, cloakrooms and wardrobes, and teaching equipment. *Special rooms* include rooms for general use, such as play room, auditorium, library, lunch room, gymnasium, and swimming pool, teachers' rooms, medical suite, janitors' rooms, offices, store rooms, and rooms for industrial and household arts, general science, music and drawing.

The very best possible school *site* would receive a score of 125 out of the total score of 1000. The *building* would receive 165; the *service systems*, 280; *classrooms*, 290; and *special rooms*, 140. For these 15 schools the sites score from 51 at the Hawthorne to 115 at the Jefferson. Buildings score from 84 at the Franklin to 151 at the Lincoln. Service systems score from 75 at the Columbus to 215 at the Lincoln. Special rooms score from 27 at the Franklin to 106 at the Lincoln. A glance at this table shows that some of the older schools have good features and that some of the more recent schools have some relatively poor features.

In order to give a clearer picture these scores have all been expressed in Table XIII as percents of perfect scores.¹ Here one may readily pick out the weak and strong points in each of the school plants. In all cases, the highest score possible is 100 percent. The Lincoln classrooms score 96 percent, or almost perfect. In special rooms, however, the Lincoln falls to 75 percent. This is due to the unfinished assembly room and play rooms and to the lack of proper lunch rooms, all of which can be added and have been planned for.

Reading the figures vertically it is seen that school sites score from 40 to 89 percent; that building scores range from 51 to 91 percent; that service systems score from 26 to 76 percent; that classrooms score from 64 to 98 percent; and that in special rooms

¹ By perfect is meant highly satisfactory in every way. So many things are considered that perfection or completely satisfactory sites are rare.

TABLE XIII

SCORES EXPRESSED AS PERCENTS OF PERFECT SCORES

School	Site	Bldg.	Service System	Class Rooms	Special Rooms	Total Score
Lincoln.....	89	91	76	96	75	87
Univ. El.....	58	52	66	86	58	77
Longfellow.....	89	83	61	92	54	77
John Muir.....	92	70	62	88	63	76
Jefferson.....	90	80	62	83	58	75
Oxford.....	88	77	56	86	43	71
1000 Oaks.....	83	71	56	85	54	70
McKinley.....	82	62	52	81	54	66
Emerson.....	78	67	56	78	49	66
Washington.....	72	72	41	77	61	64
Le Conte.....	82	64	46	68	48	58
Whittier.....	76	62	41	71	38	57
Franklin.....	80	51	31	73	19	51
Hawthorne.....	40	52	43	67	27	49
Columbus.....	64	52	26	64	34	48

the range is from 19 to 75 percent. If we think of 100 percent as a very superior score, of 50 percent as an extremely poor score, and 75 percent as a fairly passing score we are then able to get a good general picture of the Berkeley elementary school buildings. In special rooms they are decidedly mediocre, while in ordinary classrooms they are fair to excellent.

ELEMENTARY CLASSROOMS. An examination of this table shows that in 6 of the schools the regular classrooms constitute the best feature of the plant. In 2 the site and classrooms score alike. In the remaining 7 the classrooms are second only to the site. In no school are the classrooms among the poorer features. We may say then that the best single feature of Berkeley's elementary school plants is the classroom. However, we should examine this column carefully, for it appears that in 3 schools the classroom scores fall below 60 percent, and in 7 they score below 80 percent.

It must be remembered that these scores cover in each case the entire list of classrooms used by the school. When a score is low it may be due either to generally poor rooms throughout the plant, or to a few extremely poor ones in an old part of the plant. Further, it may be due to many moderately poor features or to a few extremely poor features.

TABLE XIV

CLASSROOM SCORES—WITH PERFECT SCORES. (DETAILS FOR COL. IV IN TAB. XII)

Case	Location		Construction		Light		Cloak Rooms		Equipment		Total	
	Score	%	Score	%	Score	%	Score	%	Score	%	Score	%
Smallest.....	20	57	56	58	38	44	10	40	31	62	178	61
Lower Q.....	30	85	62	65	69	81	15	60	38	76	206	71
Median.....	30	85	74	77	74	87	19	76	42	84	235	81
Upper Q.....	33	94	83	87	78	91	22	88	44	88	256	88
Highest.....	35	100	91	95	83	97	23	92	50	100	281	96
Perfect.....	35	100	95	100	85	100	25	100	50	100	290	100

The detailed scores and the percent these scores are of perfect scores are shown in Table XIV, for each of the five features of classrooms, including location, construction, light, cloakrooms, and equipment. The table shows the lowest, the highest, the median and the two quartile scores.¹ At the bottom of the table are shown the highest possible scores. An inspection of these scores shows that the principal weaknesses are in general construction and in light. Many poor cloakrooms also account for low scores. Not many classrooms score low on equipment, and relatively few in the matter of location. In location, the Columbus, Emerson, and Franklin rank lowest. In construction, the Whittier, Washington, and Franklin; in light, Le Conte, Hawthorne, Columbus; in cloakrooms, the Franklin, Le Conte, and Whittier; and in equipment, the Le Conte, Columbus, and Franklin received the lowest scores.

Poor light is accounted for in too many instances by dark paint or tinting. The dark gray used in a number of schools should give place in all cases to light buff or very light green for walls and with white or light cream ceiling. In numerous cases the windows are wrongly placed in the room, in others wrong kinds of shades are in use. In general, no light should be admitted in front of the front row of seats in a room. Windows should reach close to the ceiling and be no more than 12 inches apart. They should be provided invariably with translucent shades and in addition, with opaque shades where light requires it.

¹In all such tables of scores the lower quartile case will refer to the fourth from lowest, and the upper quartile to the twelfth, or fourth from highest score.

In equipment the movable furniture in use in the Berkeley schools is to be commended. The idea is thoroughly sound, both educationally and economically. Further, inspection shows that teachers and principals in Berkeley schools know how to use such furniture to solve problems of wrong lighting, problems of co-operative work among the pupils, problems of fitting children to seats of the right size, and how to do things with seats moved to one side as required. Where movable furniture is in use there is evidence of ease and informality and comfort as opposed to the usual stiffness with its signs of discipline and artificial life and movements.

Other evidences of a modern school system are observable, too, in the numerous sand tables, aquaria, nature study materials, closets, cabinets, study tables, pianos, phonographs, radios, pictures, maps, and books. These things amount to only a small item in a school budget, but they are of great value in instruction. As features of the classrooms they largely mark the difference between the modern and ancient meaning of education. These features are not found in all of Berkeley's classrooms, but they are common, and movable furniture is the only kind that is now being purchased. This, the survey heartily commends.

THE SCHOOL SITE. The score card provides 5 separate scores on the value of the school site; 2 on location, 2 on drainage, and 1 on size and form. From a study of these scores in detail it is clear that in the matter of location the Hawthorne scores less than 30 percent perfect. This location is wholly unfit for a school, due to the fact of its proximity to the factory district. Sulphur fumes are very offensive at all times. Since factories are rapidly taking over this section of the city, it is needless to comment on this site further. The building and site are both wholly unsuited to use, and soon, because of the encroachment of industries, the school will have no children. Accordingly it will be recommended that this site be abandoned at the earliest time possible.

The Washington site scores low on location because the building is off on one side of the territory served and is located on a very busy corner and very close to the street on two sides. The Franklin location is poor because the building is on a very busy thoroughfare. In the matter of drainage the Hawthorne site was found very poor, scoring slightly over 50 percent perfect. In this feature Emerson scored rather low, though all the other sites

scored high. The Emerson grounds can be graded to somewhat better advantage, though the defect is not one that affects the health or safety of the children.

The question of size of grounds will be treated later. Here it may be noted that the scores are based upon size and form of grounds and upon kind, amount, and placement of apparatus. The standard required is 100 square feet per pupil as a minimum. Several of the sites score low on this point partly because of the small amount of land available, partly because of the form of the grounds, in some cases divided by a street, and to some extent because of lack of equipment. (See a later section in this chapter for further consideration of school grounds.)

THE BUILDING. The building as a unit is scored separately under the following items: orientation, position on site, type, material, height, roof, foundations, walls, entrance, aesthetic balance, condition, stairways, corridors, basement, color scheme, and attic. These many scores are then condensed in three groups, shown in Table XV, and these finally into a single score as was shown in Table XII.

TABLE XV

DETAILED BUILDING SCORES WITH PERFECT SCORES

Case	Placement		Gross Structure		Internal Structure		Total	
	Score	% Perfect	Score	% Perfect	Score	% Perfect	Score	% Perfect
Lowest.....	10	40	24	40	21	25	84	51
Lower Q.....	16	64	35	58	50	62	86	52
Median.....	18	72	38	63	59	73	111	67
Upper Q.....	20	80	42	70	70	87	128	77
Highest.....	23	92	56	94	76	95	151	91
Perfect Score.....	25	100	60	100	80	100	165	

Table XV shows the distribution of the detailed scores under three headings. On the basis of a study of these detailed scores we may say that in the matter of placement on the school site the Franklin scores lowest. It is on a very noisy street and its classrooms get far from the best lighting. With a few exceptions, however, the buildings are well placed on the school site and are properly oriented. Doubtless no one of these schools was deliberately placed close to a street car track, but in some cases this heavy traffic has developed later and is now causing serious difficulty.

In the matter of gross structure the Lincoln school scores highest, the Columbus lowest, with University Elementary falling half way between. In gross structure, 4 schools, the Columbus, Hawthorne, Franklin, and McKinley, all score less than 50 percent perfect, while the Lincoln, Longfellow, and John Muir score from 75 to 94 percent perfect. In internal structure, the Franklin, Columbus, Hawthorne, and University Elementary score very low, the latter school reaching only 62 percent of perfect.¹ In this group of items, however, no single one seems to account for low scores. Stairways, if any single item, should be mentioned as frequently below other parts of the building. There are few fireproof stairways and corridors in the buildings.

SERVICE SYSTEMS. The service system of a school building is scored on 31 separate points. These detailed scores are then combined, as in Table XVI, in which is shown for each of the 7 groups of items the lowest, the highest, the median, and the upper and lower quartile scores assigned to the 15 elementary schools. The perfect score is indicated in the table and each score is expressed as a percent of this perfect score.

TABLE XVI

DETAILS OF SCORES ON SERVICE SYSTEMS. (SHOWING SCORES, PERFECT SCORES, AND PERCENT SCORES ARE OF PERFECT SCORES)

Case	Heat Vent.		Fire Protec.		Clean- ing		Art. Light		Elec. Sys.		Water Sup.		Toilet Sys.		Total	
	Score	%	S.	%	S.	%	S.	%	S.	%	S.	%	S.	%	S.	%
Lowest.....	16	20	11	17	7	35	1	5	3	20	10	33	8	16	75	26
First.....	28	35	20	31	9	45	6	30	4	27	13	43	25	50	116	41
Median.....	41	51	26	40	12	60	10	50	9	60	15	50	39	78	156	56
Second.....	50	63	33	51	13	65	16	80	12	80	16	53	44	88	174	62
Highest.....	59	74	54	83	14	70	20	100	13	86	19	63	46	92	215	76
Perfect Score.....	80	100	65	100	20	100	20	100	15	100	30	100	50	100	280	100

It will be seen that the highest total score was 215, or 76 percent perfect, and that the lowest was 75, or 26 percent perfect. The buildings receiving these scores were the Lincoln and Columbus, respectively. Of the 15 schools, 6, including Columbus, Franklin, Whittier, Washington, Hawthorne, and Le Conte, fall below 50 percent perfect on this item, while but 1, the Lincoln, scores above 75 percent.

¹The word perfect is used for sake of brevity and means "in every way highly satisfactory."

When the 7 major items included are examined separately, however, we see very wide variety on every item. Heating and ventilating systems score from 16, or 20 percent perfect, in the Washington, to 59, or 74 percent perfect, in the Lincoln, with 7 schools, the Washington, Columbus, Franklin, Whittier, McKinley, Emerson, and Longfellow, falling below 50 percent.

In *fire protection* the range is from 11, or 17 percent, in the Columbus, to 54, or 83 percent, in the Lincoln, and with 11 schools falling below 50 percent perfect. The lowest scores fall to the Columbus, Franklin, Le Conte, Washington, Whittier, Hawthorne, and McKinley. The Lincoln, University Elementary, John Muir, and Thousand Oaks ranking highest in this respect.

In *cleaning systems* one extreme is found in the Hawthorne, with a score of 7, or 35 percent, and the other in the Lincoln and Jefferson with scores of 14, or 70 percent. Five fall below 50 percent on this point, and none reach 75 percent. This is a feature that has received little attention, even in the newer buildings.

In *artificial lighting* the Columbus has a score of 1, or 5 percent, and the Longfellow is highest, with a score of 20, or 100 percent. Six fall below 50 percent, and only 4 exceed a score of 75 percent. Other than Columbus, the McKinley, Franklin, and Le Conte rank very low.

In *electric service system* the lowest score is 3, or 20 percent, at the Columbus, with Whittier, Franklin, and Le Conte only slightly higher; and the highest 13, or 86 percent, at the University Elementary. On this point 7 schools fall below 50 percent and but 4, the University Elementary, Lincoln, McKinley, and Longfellow, exceed 75 percent.

In *water supply systems* the scores are uniformly low, ranging from 10, or 35 percent, at Hawthorne to 19, or 63 percent, at McKinley. This score is based upon drinking, washing, and bathing facilities, with hot and cold water available. In this item 6 schools, the Hawthorne, Franklin, Le Conte, John Muir, Longfellow, and Thousand Oaks fall below 50 percent and none exceeds 63 percent.

The final item, *toilet facilities*, ranges from very poor at the Hawthorne, which scored but 8, or 1 percent perfect, to 46, or 92 percent, at the McKinley. On this item the Hawthorne, Columbus, Le Conte, and Franklin are exceedingly poor. The Franklin

toilets are being replaced now. Perhaps some repairs might be effected at the Le Conte to serve two or three years but the other two buildings should be abandoned as soon as possible.

Summing up these details, it is not exaggerating to say that more than one-third of the schools are very poorly equipped in the matter of service systems. There are many toilets that are unsanitary in spite of the superior janitor service that is everywhere evident. This is partly due to antiquated equipment, but in no small way to wrong placement and to lack of ventilation.

SPECIAL ROOMS. By special rooms is meant large rooms for general use, such as: play rooms, auditorium, library, gymnasium, swimming pool, and lunch room; rooms for the school officials, such as offices, teachers' room, medical suite, and janitor's room; and special service rooms for household arts, industrial arts, general science or drawing, and store rooms. In the total score of 1000 on a building, 140 is the amount covering special rooms.

TABLE XVII
SCORES ON SPECIAL ROOMS

Case	General Rooms		Officials		Special Service		Total	
	Score	%	Score	%	Score	%	Score	%
Lowest.....	0	0	9	2	8	20	27	20
First Qr.....	17	26	15	43	18	45	55	39
Median.....	22	34	25	71	24	60	76	54
Second Qr.....	33	51	27	77	28	70	82	58
Highest.....	42	57	31	88	38	97	115	81
Perfect.....	65	100	35	100	40	100	140	100

Table XVII presents in scores, and in percent of perfect scores, the highest, lowest, median, and two quartile scores on each of the three main groups of items. It should be pointed out that this feature of a building is very important in its bearing upon instruction. It has been noted above that the schools of Berkeley are doing much to bring instruction into line with the best modern conception of education. To do this well, they must have the special rooms covered by this item.

From Table XIII it was noted that no elementary plant scored over 75 percent perfect on the item of special rooms; and

that 7 of the 15 scored below 50 percent. This explains one of the handicaps under which research, supervision, and instruction are now operating. From Table XVII it becomes clear that the weakest point is the lack of large general rooms for socialized work and for community service. When we consider that even the newest and best buildings score only 75 percent perfect on this item we must be convinced that Berkeley's school buildings are far behind the theory of instruction which the schools are trying so hard to carry out.

The buildings that rank lowest in the matter of large rooms for general use are the Franklin, Hawthorne, Longfellow, Columbus, and Whittier. Those having poorest rooms for school officers are the Franklin, Columbus, Whittier, Hawthorne, and Le Conte. In special service rooms the Hawthorne, Oxford, Columbus, and Le Conte ranked lowest.

It must be kept in mind that there is no economy in investing in a high-class curriculum and staff and then erecting buildings that virtually prevent the schools from realizing on the investment. In fairness, though, it must be said that the poor plants are either old plants erected before the more recent developments in education, or the later buildings, the construction of which is not yet completed. The Longfellow and the Thousand Oaks will be excellent buildings when completed, though at present they score low at certain points.

4. BERKELEY'S ELEMENTARY BUILDINGS COMPARED WITH THOSE OF OTHER CITIES

THE COMPARATIVE METHOD USEFUL. It is one thing to judge Berkeley's school buildings against the standards of this more or less objective measuring instrument and a slightly different thing to judge them by what is found in other cities. This score card is made up of the combined judgments of experts, and its application provides us with a quantitative estimate of the worth of the school plant. Looked at alone, the Berkeley scores seem to indicate that the buildings are very far from perfect. On the whole, they appear rather mediocre, with a range of scores from 865 down to 477 and with an average score of only 663 or 66 percent of what would be regarded as a very excellent or superior building. The question naturally arises: Is a perfect score so much a luxury that it is rarely obtained?

To answer this question Table XVIII is presented showing the scores obtained on elementary school plants in 6 other cities in comparison with Berkeley's scores. The scores are given in groups showing the number and the percent of the schools that fall in each group. For instance, Berkeley has 2 schools, or 13.3 percent of the 15 elementary schools, which scored between 401 and 500. Berkeley has 3 schools, or 20 percent of all elementary schools, that scored between 501 and 600.

BERKELEY NOT FAIRLY COMPARABLE WITH OLD CITIES. In reading this table we must keep in mind that these cities are not entirely comparable with Berkeley. All these cities are very old in comparison, and most of them are several times Berkeley's size. Also the scores are for different years. With these differences in mind, the reader may form some judgment of the position Berkeley ought to hold in this group. It is the writer's judgment that not 10 percent of the educators of the country would hesitate to say that Berkeley should rank the highest of the group, even though among western cities Berkeley does not rank as a wealthy city.

The 1923 census report, the latest in print at this writing, shows that Berkeley's aggregate tax rate per \$1000 of estimated true wealth was only \$11.15, against corresponding rates of \$14.06 in Philadelphia, \$16.15 in St. Paul, \$19.37 in Utica, and \$21.15 in Baltimore. St. Joseph had a rate of \$9.13, or \$2.02 lower than Berkeley's rate. In per capita true wealth Berkeley surpasses St. Joseph and Utica, but is lower than the other cities, being about midway between the lowest and the highest of the 6 cities. So, from the standpoint of ability to pay for schools, Berkeley is not at a serious disadvantage in this group.

COMPARISON OF SCORES. Turning to the figures of this table, it is seen that Berkeley has less than 2 percent of all elementary schools in the groups scoring 500 or less. Philadelphia has 36.8 percent; Atlanta, 63 percent; Baltimore, 75 percent; Omaha, 31 percent; St. Paul, 18 percent; St. Joseph, 13.7 percent; and Utica, none in this group. From this, it appears that Berkeley is in a favorable position.

There probably was a time when all the other cities of the group were in the position Berkeley now holds. Instead of facing the situation, however, they permitted their buildings to decay until now some of these cities are in a hopeless plight. That is

TABLE XVIII

BERKELEY'S ELEMENTARY SCHOOL BUILDINGS

Compared with Buildings in Other Cities'

(Based on Strayer-Engelhardt Scores)

SCORE	Berkeley 1926		St. Paul 1917		Omaha 1917		Philadelphia		Baltimore 1921		Atlanta 1922		Utica ¹		St. Joseph 1923	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
0-100									2	1	4	6				
101-200									15	11	8	13			1	3.4
201-300							2	0.6	20	14	8	13			3	10.3
301-400			2	4	5	10	24	8.0	36	26	14	22			9	31.0
401-500	2	13.3	7	14	11	21	85	28.2	32	23	6	9	1	5.5	7	24.1
501-600	3	20.0	23	47	17	32	93	30.9	20	14	18	28	3	16.6	2	6.9
601-700	3	20.0	13	27	10	20	59	19.6	12	9	6	9	6	33.3	6	20.6
701-800	6	40.0	3	6	8	15	27	9.0	3	2			7	38.9	1	3.4
801-900	1	6.6	0	0	1	2	11	3.7					1	5.5		
901-1000			1	2												

1. Scores, except Utica, from Standards for Elementary School Buildings. Strayer and Engelhardt. Teachers' College, New York, 1923.

2. A report of the survey of the Utica School System. George M. Wiley, Albany, N. Y., State Department of Education. 1918.

not only very bad education, but it is bad business as well. When one considers the scores in this table and thinks of the Columbus or Hawthorne buildings it is difficult to understand why these old cities have permitted their buildings to deteriorate as they have.

Berkeley parents should study this table with care and consider whether they are going to allow their city to drift into such a hopeless position as at least 6 of these cities are now in. The taxpayers of Berkeley should decide now whether it pays to make this sort of investment in education or whether it is not better economy to keep to a higher standard.

If we view the upper end of the scale in this table we see again that Berkeley holds a good position. There are a few better buildings in St. Paul than are to be found in Berkeley, but otherwise Berkeley stands out as the highest. More than 46 percent of Berkeley's schools score above 700. Atlanta has no scores above 700; Philadelphia has less than 13 percent; Baltimore, 2 percent; Omaha, 17 percent; St. Paul, 8 percent; and St. Joseph, 24 percent in this group. Utica with 44.4 percent is the only one that surpasses Berkeley's position.

MEANING OF THESE COMPARISONS. This table is valuable, not merely as a basis for congratulating Berkeley upon having relatively good buildings, but more especially in showing what Berkeley must not allow to happen. It is, after all, a question of our standard of living and the cost of maintaining it. Berkeley is unlike most of these cities in this respect. Atlanta and Baltimore may wish for an acceptable standard in school plant, and they may even strive hard to get it, but they are virtually certain not to get it in the present century, if they ever do. Berkeley can reach that standard inside of 5 years and, with good management, can maintain that position indefinitely unless something very unexpected happens to the city's rate of wealth increase.

We may well consider whether these figures do not reflect the general social, business, and political tone of these cities. Whether poor school buildings are cause or effect of low general social standards need not detain us. That the two tend to go together is often observed. This table should not leave the parents of Berkeley gloating or complacent. It should leave them very conscious of the danger they are in if they do not take up the slack in their school homes before it is beyond their ability to pay the cost.

5. JUNIOR HIGH SCHOOL SCORES.

TOTAL SCORES. Berkeley's junior high schools are all in need of more room. As they stand, however, these four buildings are of average quality. They were wrongly constructed at points but, on the whole, they are good buildings and should be expanded to meet the needs that are even now very pressing at some points and are growing rapidly. The general character of these buildings is shown by Table XIX, which gives the total scores and the scores for each of the 7 main subdivisions. These scores may easily be compared with the perfect scores shown at the foot of the table.

TABLE XIX

SCORES OF JUNIOR HIGH SCHOOL BUILDINGS

School	Maximum Scores Possible and Actual Scores							Total Score
	I Site	II Bldg.	III Service System	IV Class Rooms	V Special Rooms	VI General Service Rooms	VII Admin. Rooms	
Garfield.....	87	121	183	105	89	86	16	687
Edison.....	71	113	179	103	101	68	14	649
Burbank.....	70	108	183	116	94	67	24	662
Willard.....	82	116	190	117	59	65	11	640
Perfect Score.	100	155	270	145	140	140	50	1000

THE SCHOOL SITE. The scores on site are to be understood as referring to accessibility, environment, drainage and soil, and upkeep of site, as well as to amount of land. On the latter point alone, of course the Garfield would stand out more than it does. The only question is whether these sites can be expanded as need arises. This question will be treated more fully in a later section.

THE BUILDING SCORES. On the item of *building* alone the schools score only fair. Garfield rates almost 80 percent perfect, but Burbank, the lowest, falls below 70 percent. The Burbank is a rambling plant with a small playground and the building is so placed as to suffer constant damage in the form of broken windows. A two-story compact plant would have been far wiser on such a site. However, with proper additions to the grounds, this

can be overcome. The Edison is also wrongly placed on the site, and the gymnasium is in an awkward position with reference to the playgrounds. The internal arrangement of the Edison is generally poor and ill-adapted to a junior high school program. It hardly seems possible that any thought could have been given to the actual program of instruction when this building was planned. The shifting of departments has been necessitated by growth of the school and as a result several departments are now in very unsatisfactory quarters.

In the Garfield the construction is partly good and partly poor. The toilet rooms here, as in many of Berkeley's schools, have but one side exposed, and inadequate ventilation is usually the result. Many classrooms have wrong exposure, the four points of the compass being about equally represented. In a building of this type the corridors ought to be fireproof, but here they are not. As now operating, there is a fire risk that should have attention. The cafeteria in the garret is certainly not a satisfactory arrangement, though of course this will be corrected with the completion of the plant. Three separate basements is a wrong idea also and increases operating costs.

THE SERVICE SYSTEMS SCORES. The heating and ventilating, fire protection, cleaning, lighting, electric service, water supply, toilets, mechanical service, and storage systems score from 70 percent in the Willard to 66 percent in the Edison. The principal weakness here is in poorly arranged and poorly ventilated toilet systems, and unsatisfactory or inadequate water and locker systems.

CLASSROOM SCORES. There are many excellent and many poor classrooms in these four schools. Some are poor because they are not used for the thing for which they were intended and are best fitted. This cannot be avoided until more rooms are provided. Many are poor because they have a wrong exposure. North and south light is generally unsatisfactory. Many others are poor also because they are very much too small. This was a mistake in construction that will in many cases be difficult or impossible to correct.

OTHER FEATURES. In special rooms, in general service rooms, and in administrative rooms it will be seen that all the buildings score low. Proper allowance was made for features not needed in

a junior high school program, but even then the scores show clearly that these important features are generally poor. This, again, is in part due to the fact that the schools have grown too fast for the additions that have been made to space, and that these features were never planned for the expansions that could easily have been anticipated.

It should be emphasized here that these features constitute a large part of the difference between a real junior high school plant and the old-time grade school house where education was merely a teacher with books and children in any sort of room. If Berkeley expects to hold a high position among cities for excellence in junior high school service, then attention must be given to these specialized parts of the city's school plant. It is very clear that the total scores on these buildings are kept high not by excellence in the educational requirement of the modern curriculum, but by the features that have to do with instruction of the usual older type. All these buildings can be brought into fairly good condition, however, as will be explained later.

6. THE SENIOR HIGH SCHOOL

The senior high school was not checked up by the score card method. Instead, some general description and comments will be offered here as a basis for judging the adequacy of this plant.

THE PLANT CHARACTERIZED. The plant, consisting of some 13 separate structures, now houses the part-time school as well as the regular high school. This means that two types of school purposes must be served and that, accordingly, two school plans must be adjusted to each other so that it will be possible for the two to use the classrooms, the shops, and the special rooms available. It is needless to point out that these adjustments are difficult to make, and in many instances they are at best far from satisfactory educationally. Certainly there is little chance for the part-time school to develop a sound program when it must be housed in such a make-shift fashion.

When the high school plant is viewed as to type of structure we find one good cement building, an old brick building, a small cement auditorium, a cement science building and various wooden structures, all of the latter being thoroughly unsatisfactory in most every way. The old Grove Street building would score perhaps 550. It can still be used, but it is mediocre or poor at virtually every point.

It is obvious that all the old wooden buildings should be abandoned as soon as possible. The remaining buildings on this block can be used for a time, until a proper home can be developed for the part-time school, and then rearranged or abandoned as school buildings.

MEASURE OF INADEQUACY IN SPACE. In order to make clear the difficult conditions under which high school work is now being handled, Table XX is presented, showing just what use is now being made of the main high school building. Leaving aside for the moment the question of whether this building is well arranged, and taking the four floors with their 35 classrooms, this table will make clear the fact that this building is being utilized to more than its fullest extent.

This table reads as follows: On the ground floor there are 7 classrooms. In these 7 rooms there are now 344 seats. If these rooms were seated according to standard (15 square feet per seat) they should have only 237 seats instead of 344. If these rooms, as now seated, were used up to their limit then 13,760 pupil-class-hour recitations could be conducted in them each week.¹ If they were used up to the limit of standard seating capacity then only 6780 pupil-class-hour recitations per week would be possible. In reality the school is actually using them for 10,955 pupil-class-hour recitations. That means that they are getting only 79 percent of capacity service out of the rooms now as they are, but, according to standard seating they are getting 161 percent of capacity use.

If each room were used full 8 periods per day and for 5 days per week it would be in use 100 percent of the teaching time. It will be seen that the 7 rooms on the ground floor are in use 98 percent of the time. On the first and second floors it will be seen in this last column that the rooms are in use 105.6 and 106.2 percent of the time. This is so counted because in order to get all their classes into the rooms available they are compelled to use the noon hour, that is, a ninth hour. This is not a serious

¹ Pupil-class-hour recitation means that each pupil is counted once for each time he recites in a room. A class of 30 at work in a room one period would give us 30 pupil-class-hour recitations. If they were at work in the room 8 hours in the day for 5 days per week then that would give us 30x8x5, or 1200 pupil-class-hours as the total use made of the room. If the seating capacity of the room were 40 then the capacity of the room would be 40x8x5, or 1600 pupil-class-hours per week.

TABLE XX

SHOWING THE USE THAT IS NOW BEING MADE OF THE ACADEMIC BUILDING BY THE HIGH SCHOOL

FLOOR	No. of Rooms	No. of Seats		No. of Class-Hour Sitzings per Week		Class-Hour Sitzings Actually Used in Week			% of Total School Time the Rooms are Now in Use
		Now Provided	Required by Standard	Now Available	Available if Seated to Standard	No.	% of those Available	% on Standard Basis	
1	2	3	4	5	6	7	8	9	10
Ground.....	7	344	237	13,750	6,780	10,955	79	161	98
First.....	11	382	368	15,280	14,720	12,230	80	83	105.6
Second.....	12	484	342	19,360	14,420	16,710	86	115	106.2
Third.....	5	208	123	8,320	4,920	6,170	74	125	100
Total.....	35	1,418	1,070	56,720	40,840	46,065	72	112	100.4

NOTE: COL. 2 indicates the number of rooms now being used for instructional work. The library is not included.

COL. 3 shows the number of pupils for whom seats or work equipment is now provided.

COL. 4 shows the number that could be provided for if standard space (15 sq. ft. per sitting) provisions were adhered to.

COL. 5 shows how many pupils could be housed for work if each seat were occupied every hour (8 hrs. each day) in the day and 5 days in the week. This means that one seat would provide 1x8x5 class-hour sittings per week.

COL. 6 shows what this figure would be if standard space (15 sq. ft.) had been allowed for each seat.

COL. 7 shows the number of class-hour sittings that are actually in use now. Each chair or desk should provide for 40 sittings; if only 20 are in use then only a 50 percent return is being realized on the investment and there is room for 100 percent expansion, providing (1) the pupils are available, and (2) it is possible to administer the work so that perfect adjustment between number of pupils and number of seats can be effected. A perfect adjustment is almost certainly impossible with the present program of education.

COL. 8 shows to what extent the school is making use of the actual space and seats available. It is obtained by dividing Col. 7 by Col. 5. It describes the situation as it is.

COL. 9 shows what this figure would be if 15 sq. ft. of floor space had been allowed for each seat. It is obtained by dividing Col. 7 by Col. 6.

COL. 10 shows what percent of 8 hours per day for 5 days a week the rooms are used. It will be seen that the rooms (excepting the ground floor) are in use more than 8 hours per day. The program is arranged so that there is an overlapping at the noon hour.

difficulty and it tends to lighten the load at numerous points in the building, and particularly in the lunch room at noon.

One only has to glance at these figures to see that this building is very much over-loaded. The building has provided 1418 seats where health rules would permit only 1070. This means 56,720 pupil-class-hour recitations per week where there should be but 40,840. The building is actually used for 6065 pupil-class-hour recitations per week more than it should be used for, and this is in terms of a very conservative standard. Many regard 18 instead of 15 square feet per pupil as a proper standard.

CLASSROOMS OVERCROWDED. This serious overloading of the main building leads to a further study of how the individual classrooms in the several high school buildings are adjusted to the loads they carry. The results of this study are set forth in Table XXI which covers a total of 60 classrooms. Laboratories and exceptional rooms were not included for the reason that in such rooms over or underloading would likely be impossible to prevent, and while objectionable is not objectionable in quite the same sense as would be true of regular classrooms.

In this table may be seen the number of rooms now in use that are over and under seated. The vertical column in the center of the table shows the number of Standard (15 sq. ft. per child) sittings possible for the room.

On the left the vertical column shows how many of the 60 rooms of each of these standard sizes is now seated below its proper capacity. On the right the vertical column shows how many are now seated above capacity. At the top the figures show by how many seats the rooms are under or over seated. The first line of the table describes 3 rooms. Two of these now have in them 15 or 16 seats too many. They should have 13 but actually have 28 or 29. The other room in this line of the table is a room that should have 13 seats but actually has 21 or 22 more than this. That is, it has 34 or 35 seats in it.

The vertical column in the center of the table shows that the high school is using rooms that may properly hold from 13 to 64 seats. At a glance it will be seen that all but two of the rooms that should hold 28 pupils or less are over seated. Some of them contain more than twice the proper number of seats. On the other hand, not one of the large rooms is over seated. The left side of this table shows just the opposite of this, *viz.*, that practically none

TABLE XXI

THE SEATING OF HIGH SCHOOL CLASS ROOMS

(Not including laboratories or special rooms)

Total	Number of Rooms Having Too Few Sitzings by																	Standard Number of Sittings*	Number of Rooms Having Too Many Sitzings by													Total
	33 34	31 32	29 30	27 28	25 26	23 24	21 22	19 20	17 18	15 16	13 14	11 12	9 10	7 8	5 6	3 4	1 2		1 2	3 4	5 6	7 8	9 10	11 12	13 14	15 16	17 18	19 20	21 22	23 24		
.....																		13	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	1	.....	3	
.....																		15	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	1	2	
.....																		19	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1	
.....																		22	.....	.....	1	.....	1	.....	.....	1	2	.....	.....	.....	5	
2																	1	1	23	.....	.....	1	.....	.....	.....	.....	.....	1	.....	.....	2	
.....																		24	.....	2	.....	2	.....	.....	1	1	.....	1	.....	.....	7	
.....																		25	.....	1	1	.....	1	2	1	1	1	.....	.....	.....	8	
.....																		26	.....	.....	.....	1	.....	.....	.....	1	.....	.....	.....	1	3	
.....																		28	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	
1																	1	30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
.....																		36	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	
.....																		37	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	1	
1												1	.....	.....	.....	.....	.....	39	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
1													1					42		* This means that the number of sq. ft. in each room was divided by 15 to get the number of seats permitted by standard. Two of the rooms by this measure could have 13 seats. In reality they each have (13 + 15) or 28.												
1																	1	43														
4								1	1		1		1					47														
3							1	1		1								50														
1												1						52														
1				1														53														
2							1	1										54														
1											1							55														
2								1				1						56														
1				1														58														
1						1												60														
1			1															62														
1										1								63														
1	1																	64														
25	1	.....	1	2	.....	1	2	4	1	3	1	3	2	.....	.....	3	1	.....	2	4	3	3	4	2	3	6	3	2	1	2	35	

of the small rooms are underseated and that practically all the large rooms are.

Adding up the cases on the right side of the table we find that in the 35 rooms that are over seated there are now 1234 seats where there should be but 827. That means an over seating of over 32 percent. From the standpoint of health alone this should not be permitted. City ordinances prevent our overloading public buildings for special occasions and yet we permit overloading of classrooms where the danger is just as real though not quite so obvious. No visitor to these rooms would fail to see many flushed faces and other evidences of a lack of oxygen in classrooms, and this in spite of open windows.

The left side of Table XXI shows that in the 25 rooms that were under seated there are now but 825 seats where there could be 1225. That is, these rooms are underloaded by over 32 percent. All but 4 of these rooms are now seated for 40 pupils.

BUILDING AND SCHOOL ORGANIZATION NOT IN ADJUSTMENT. This brings out an important point about the high school plant. It is perfectly plain that the high school does not have very small and very large classes. High school classes range from 4 to 55 pupils (not including physical education). However, of the 469 classes more than half are between 25 and 35 pupils. Another 18 percent are between 20 and 25 pupils. There are only 15 classes of 40 pupils or over, yet 21, or over one-third, of the classrooms in this table are large enough for from 42 to 64 pupils.

It goes without saying that high school classes cannot all be the same size and that we cannot know, even one term in advance, the size of all classes that will be held. It is obvious that there will be some large classes and also some small ones as noted above. Berkeley has been able to keep to a good average size and does not have large numbers of exceptionally large or exceptionally small classes.

If the size of classes were perfectly adjusted to the size of rooms to be occupied we should need a few small and a few large rooms, and many medium sized rooms in a high school plant. When it comes to working out the adjustment of classes to rooms it is at best impossible to make them perfect. In other words, we cannot reasonably hope to get a full 100 percent service from a high school building without permitting the buildings to dictate the school program. The figures of Tables XX and XXI show

that Berkeley has not permitted the building to determine the size of classes, but it also shows that the lack of adjustment is wasteful of space at one extreme, and that it operates as an educational and health handicap at the other. The amount of this misadjustment is larger than it should be, and is due to the fact that there are far too many small and large rooms, and too few medium sized rooms for the classes as they are and should be organized.

MISADJUSTMENTS COULD HAVE BEEN AVOIDED. In some of the buildings these misadjustments could have been foreseen had the building plans been studied in the light of an actual educational program. Again it needs to be repeated, that school buildings must be developed with reference to specific needs, needs which only an educator can determine. The inside of a school building must dictate the outside and not *vice versa*.

MORE ROOM NEEDED. Table XXII will serve to emphasize the assertion that the high school is very badly cramped in its present quarters. It unquestionably needs more room at once. In this table there are 5 collections of facts, each independent of all others. The first column shows that the rooms are now seated with from 20 to 49 seats (exceptional rooms not included). The median room in the group has 36 seats and the lower and upper quartile rooms have 30 and 40 seats, respectively.

TABLE XXII

STATISTICS SHOWING SIZE OF HIGH SCHOOL CLASSES AND
CLASSROOMS AND HOW THE ROOMS ARE AND
OUGHT TO BE SEATED

Selected Rooms	No. of Sittings per room	Sq. ft. floor space	Sq. ft. floor per sitting	Standard No. of sittings	Size of Classes
Lowest Case.....	20	194	5	13	4
1st Quartile.....	30	360	9	23	22
Median	36	393	13	26	27
2nd Quartile.....	40	713	24	50	32
Highest Case.....	49	1155	46	64	55

The second column shows similar facts for the number of square feet of floor space per room. The smallest room has 194 square feet and the largest 1155. As now seated the figures of column 3 show that children are provided with from 5 to 46 square feet of floor space each. It will be seen here that the

smallest, the lower quartile, and the median rooms fall well under the standard of 15 square feet per child; and that the upper quartile and largest case are far too liberal a provision. In fact, of the 71 rooms included in the series here represented 38, or 53 percent, are now over seated. Only 23 rooms provide from 12 to 20 square feet per seat, while 22 rooms provide from 21 to 46 square feet.

Column 4 shows the number of seats these rooms would hold if standard space were allowed. Instead of from 20 to 49 seats (column 1), they should have from 13 to 64. In column 5 is shown the range in size of classes. The smallest has 4 pupils and the largest 55. These figures supplement and emphasize the facts presented above.

Many detailed faults could be found with these buildings. The amount of space consumed by other than classrooms in the academic building is very large on at least two of the floors. A more economical arrangement of space could have been worked out. This criticism, with the criticism of the size of rooms, are two important weaknesses. The danger from fire in the old buildings is serious. The danger to children is not so great in one-story buildings, but it is doubtful economy to house expensive machinery in the midst of so much inflammable construction.

We may say, then, that the high school is in obvious and immediate need of added space and a safer place for its shops.

7. ADEQUACY OF PLAYGROUNDS

IMPORTANCE OF LAND AS PART OF SCHOOL PLANT. In the development of a school plant the cost of the necessary land is second only to that of buildings and, educationally, its importance as a part of a school plant is today scarcely second to that of the buildings. We have in the past few decades come to realize that a school building is a highly specialized type of building. More recently we have begun to realize that the school grounds must be specialized in a similar way. As the building is designed with reference to the number to be housed and to the kinds of activities that are to be carried on, so the grounds must be adjusted to numbers of pupils and to a real plan of physical and social training.

So far we have given far more thought to the organization of the building than we have to the organization of the grounds.

Until recent years we have looked upon recess periods as periods of waiting and not as periods when real training could be given to children. With that attitude we concerned ourselves little with the question of school grounds, asking only for enough ground so that the children could play and keep from causing annoyance to neighbors and to teachers. This old notion is rapidly giving place to the idea that recess periods offer the best possible opportunity for physical and social instruction and experience along with rest and recreation.

In line with this newer conception has come the necessity for developing a real physical and social education program, a program of outdoor as well as indoor life. This has brought us to consider the question of playgrounds in a new way. As to what is the best play program we shall likely not be in perfect agreement for some time. One would do nothing but formal gymnastics and calisthenics, another would have no organized play or exercise, relying solely upon the children to use their freedom for activities they liked. Between these extremes and embodying elements of both is a sounder position for the present.

EVALUATING SCHOOL PLAYGROUNDS. In applying a measure to playgrounds in this survey our first effort has concerned itself mainly with amount of ground and with amount of apparatus. Apparatus and play areas for games have of course long been standardized. The accepted standard amount of land for a school playground is 100 square feet per child for an elementary school, and from 10 to 12 acres for a high school. From the standpoint of space alone an area of 10 feet by 10 feet would seem reasonable. When one considers what activities and apparatus and what spaces would be required in order for each child to have opportunity for good physical and social training the situation is different. Square footage standards may or may not conform to our educational requirements.

To illustrate: It was found by a careful census of children on the grounds at a particular time in the day when it was considered that the largest number would be present to play (20 minutes before the end of the noon recess) that the number varied from .2 to about .8 of the total enrollment. From these figures it was assumed that the play space in elementary schools should be large enough to care for at least half the children at one time. In all high schools the load would not be over one-half since the chil-

dren use the playgrounds by groups which rotate throughout the day so that there too the noon load would be the maximum.

Having determined the number of children for whom play space is needed, the next step was to plan a play and physical training program with the necessary land requirements. To do this, the writer, with the aid of Dr. Stolz of the Survey Commission, and Mr. Hjelte of the Berkeley school department, devised the plan explained in Appendix A of this report. This plan assumes that a certain group of activities ought to be available for each child in much the same sense as applies in academic courses. These activities are listed in the left-hand column of the tables (see Appendix A). In order to have these activities available certain amounts of ground and certain pieces of apparatus are needed. Some of the games require space only but, in each of the items the amount of space is definable, as will be noted from the explanation in Appendix A and from the heading of Table XXIV.

For a school that uses one unit of each item the total play space needed would amount to 39,386 square feet. This assumes that the items could be so arranged on the ground that each group of children would not be interfered with by any other group and that none of the games would endanger the buildings, gardens, and neighboring properties, or any person passing by.

Having for each school the number of children to provide for, and the physical education program expressed as certain amounts of land area, our next step was to ascertain the exact amounts of land available for play space in each school. In order to accomplish this, maps of the playgrounds were prepared showing the total school land and the amounts of this land occupied by buildings, by walks, lawns, and gardens, and by open sheds, and the amount left available for play. The figures showing these measurements are presented in Table XXIII. This table shows for each of the schools the total number of square feet of land owned, the percent distribution of this land, the square feet of play area, the square feet of play area per pupil, and finally, the condition of the surface of the play space.

Parts of the playgrounds are merely smooth dirt surface. Part is surfaced with macadam, and part with fine rock or stège. In numerous cases there are walks running through the grounds that in no serious way lessen the value of the space for play purposes.

TABLE XXIII

DESCRIPTION OF SCHOOL LANDS BY SCHOOLS

SCHOOL	Total Land Owned Sq. Ft.	% of Total Occupied by					Sq. Ft. Used for Play Ground		% of Total Surface of Ground Area			
		Bldgs.	Walks Lawns Shrubs	Open Sheds	Gardens	Play Grounds	Total Amount	Per Pupil	Dirt	Macadam	Stege (Rock)	Play Walks
HIGH SCHOOL												
Total.....	666,992	18	21	3/100	3	59	393,968	166.1	34	3	22	2/10
Above does not include area of adjoining lots with residences on them = 5,232 sq. ft. in addition.												
JUNIOR HIGH SCHOOL												
Burbank.....	148,608	30	22	.....	.....	49	72,504	110.5	3	.....	43	3
Edison.....	111,800	43	18	.....	.....	39	44,164	59.3	17	21	.....	1
Garfield.....	836,000	5	2	.....	1	91	760,355	678.3	84	6	.....	.....
Willard.....	80,220	43	11	.....	.....	46	37,104	43.9	4/10	37	4	4
ELEMENTARY SCHOOLS												
Columbus.....	137,584	9	3	6/10	.....	88	119,308	194.5	66	20	.....	6/10
Cragmont.....	33,656	27	20	.....	.....	63	21,200	130.1	59	.....	.....	4
Emerson.....	58,432	22	9	.....	.....	68	40,092	103.6	.....	32	35	7/10
Franklin.....	185,284	8	3	1	1/10	86	160,396	263.4	69	17	.....	1/10
Hawthorne.....	91,800	12	14	.....	12*	63	57,676	206.7	42	.....	21	4/10
*also used for play.												
Jefferson.....	162,657	14	7	.....	.....	79	129,240	242.9	49	8	22	.....
John Muir.....	118,476	17	18	.....	.....	64	76,761	210.3	.....	.....	64	.....
Le Conte.....	122,904	14	7	8/10	9	69	85,230	192.8	36	33	.....	5/10
Lincoln.....	90,054	29	14	.....	.....	55	49,689	94.4	.....	54	.....	1
Longfellow.....	144,225	15	12	3/10	4	69	99,405	167.3	7	.....	59	3
McKinley.....	50,616	27	12	.....	.....	60	30,636	121.5	20	35	.....	5
Oxford.....	57,912	14	10	.....	.....	76	44,020	200.1	14	29	32	1
Thousand Oaks.....	190,962	16	28	.....	.....	56	107,820	194.6	.....	.....	55	1
University Elementary.....	82,827	37	12	.....	.....	51	42,570	177.3	.....	30	20	1
Washington.....	52,212	31	9	.....	.....	60	31,408	52.1	.....	59	.....	1
Whittier.....	54,224	29	10	2	.....	59	32,224	76.7	.....	57	.....	2

The column showing the number of square feet of play space per pupil, uses the estimated enrollment for the beginning of the school year 1926-1927.

Applying the 100 square feet per pupil standard, it appears that only 3 of the elementary schools fall below the standard amount of land for the present enrollment. These are the Lincoln, Washington, and Whittier. Of the junior high schools, the Willard and the Edison fall well below. All other schools reach or exceed this standard.

The question now arises: With this excellent showing, is it true that these amounts of land in all cases provide space adequate for carrying out a well planned program of physical training, and will the land meet the needs of the school ten years from now? To answer this, our educational standard (see Appendix A) was applied and the results are shown in Table XXIV.

In this table two sets of figures are shown. One gives the number of units of space needed by the school as the school now operates; the other shows the number of such units now possessed by the school. To read this table: The Columbus school with its present enrollment needs 1 unit of space 40x80 feet as a field for tag and miscellaneous running games. It now has space for 5 such units. It needs two spaces 12x27 feet for a low horizontal bar. It now has room for 4 such spaces. It needs 1 space 12x20 feet for low flying rings. It now has room for 2 such units. In all the items it will be seen that the present Columbus grounds are more than adequate for the present enrollment. It will be seen from Table XXIV that the school has 194.5 square feet of ground per pupil. By both standards therefore, it is clear that if this school were to remain here permanently there would be plenty of room for a substantial increase in enrollment.

Reading the figures of this table horizontally gives us a clear picture of the playground situation in each school separately, so far as amount of land is concerned. On the right of this table it will be seen that, on this basis 6 of the elementary schools are short of play space. In the Whittier, Washington, Oxford, McKinley, Lincoln, and Emerson schools there is at present no way of providing a satisfactory field for playground baseball and soccer football. This is the largest single space required. The University Elementary ground is not fully satisfactory in this respect. Thus, in spite of the fact that Emerson, McKinley, and Oxford

TABLE XXIV

ADEQUACY OF PRESENT ELEMENTARY SCHOOL PLAYGROUNDS

(See Appendix A)

SPACE UNITS WITH STANDARD SQUARE FOOTAGE REQUIRED

	Field for Tag and Miscellaneous Running		Low Horizontal Bar		Low Flying Rings		Field Playground and Baseball Diamond		Volley Ball Court		Basketball Court Unit of Two Courts		Traveling Rings		Flying Rings		Horizontal Ladder		High Horizontal Bar		Hand Ball Court		Jumping Standards and Pits		
Dimensions, ft.....	40x80		12x27		12x20		120x220		35x70		45x70		15x50		12x20		10x25		12x27		30x60		10x12		
Sq. ft. per unit.....	3,200		324		240		26,400		2,450		3,150		750		240		250		324		1,800		240		
	Units Needed	Now Have	Units Needed	Now Have	Units Needed	Now Have	Units Needed	Now Have	Units Needed	Now Have	Units Needed	Now Have	Units Needed	Now Have	Units Needed	Now Have	Units Needed	Now Have	Units Needed	Now Have	Units Needed	Now Have	Units Needed	Now Have	Shortage in Sq. Ft.
Columbus.....	1	5	2	4	1	2	1	2	1	4	2	6	2	2	2	4	2	2	2	4	1	4	1	3	.....
Emerson.....	1	2	1	4	1	2	1	0	1	2	2	1	1	2	1	4	1	3	1	4	1	1	1	1	29,550
Franklin.....	1	9	2	4	1	2	1	3	1	4	2	6	2	2	2	4	2	2	2	4	1	4	1	3	.....
Hawthorne.....	1	4	1	4	1	2	1	1	1	2	2	3	1	2	1	4	1	2	1	4	1	2	1	2	.....
Hillside.....	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	.....
Jefferson.....	1	6	1	4	1	2	1	1	1	1	2	4	1	2	1	4	1	2	1	4	1	4	1	3	.....
LeConte.....	1	4	1	4	1	2	1	1	1	2	2	4	1	2	1	4	1	2	1	4	1	4	1	3	.....
Lincoln.....	1	2	2	4	1	2	1	0	1	2	3	4	2	2	2	4	2	2	2	4	1	1	1	1	26,400
Longfellow.....	1	3	2	4	1	2	1	1	1	2	2	2	2	2	2	4	2	2	2	4	1	2	1	3	.....
McKinley.....	1	2	1	4	1	2	1	0	1	2	2	4	1	2	1	4	1	2	1	4	1	2	1	2	26,400
Oxford.....	1	2	1	4	1	2	1	0	1	1	2	3	1	1	1	4	1	2	1	4	1	2	1	1	26,400
Washington.....	1	1	2	2	1	1	1	0	1	1	2	2	2	2	2	4	2	2	2	4	1	1	1	1	26,400
Whittier.....	1	1	1	4	1	2	1	0	1	1	2	3	1	2	1	4	1	2	1	4	1	1	1	1	26,400
John Muir.....	1	2	1	1	1	4	1	1	1	1	2	2	1	1	1	2	1	2	1	2	1	2	1	1	.....
Thousand Oaks.....	1	4	2	4	1	2	1	2	1	2	2	4	2	2	2	4	2	2	2	4	1	4	1	3	.....
University Elementary.....	1	1	1	2	1	2	1	¾	1	2	2	2	1	1	1	2	1	1	1	2	1	1	1	1	6,600

have 100 square feet of play space per pupil, they do not make our proposed program of play and instruction possible and must, therefore, be regarded as unsatisfactory. This is partly a matter of arrangement or form but primarily it is a matter of amount of land.

Reading the columns vertically it will be seen that with slight exception, Berkeley's elementary schools have room for all the program except the item just noted. This is, of course, a major item. For those who lay stress upon open fields for play-as-you-please activities this would be regarded as evidence enough that these school grounds are inadequate. Aside from this one item, it will be seen that in most instances there is room for a large increase in enrollment. On the whole, therefore, it must be said that Berkeley has made very good provision for play space for the elementary schools, and it will be shown later that there is no reason why standard provision cannot be made for every school.

When this measure is applied to junior high school grounds the obvious shortage of land at the Edison, Burbank, and Willard schools is made to appear in its true significance. Of the program required by our standard (Appendix A), the Edison pupils are deprived of facilities for tennis, soccer, and baseball. The Burbank pupils cannot play tennis, soccer, baseball, and hand ball. The Willard pupils cannot play tennis, soccer, baseball, volley ball, nor have traveling rings or jumping pits. When we consider the many additional activities for which these grounds would provide opportunity for open games and healthful social intercourse we must realize that these schools are painfully short in their provision for physical and social education.

It should be realized that standing about with hands in pockets is training boys to be interested in wrong sorts of things. This ground shortage is not merely a want, it is a positive force for undoing what is done in classrooms. The seriousness of this cannot be overemphasized. It is unquestionably defeating one of the essential purposes of this new type of school. There is no age at which lack of play facilities is such a serious matter as at the age of these adolescent and preadolescent children. Accordingly this survey strongly urges this as one of the major needs of the Berkeley school system, a need that is fully equal to the need for classrooms.

This land shortage is so obvious that there seems to be no

need for an extended tabular statement of the amount of the shortage. This will be made clear in Chapter VI.

8. SUMMARY

In summing up the findings presented in this chapter it must be made clear that while the land and building needs of Berkeley's schools are substantial and even pressing at many points, yet in these matters Berkeley is in a favorable position as compared with older cities. This is cause for congratulations. None of Berkeley's buildings are hovels. They are all clean and orderly, and in decent repair. The grounds are far short in the junior high schools, and in several elementary schools, but they are far better than many cities can ever hope to have. From all this one would readily judge that Berkeley is a progressive city.

With all this showing, however, this chapter sounds a clear note of warning. The meaning of our comparisons with standards and with other cities is very clear, and they should not be treated lightly. A city is wise when it bases its action upon its own obvious needs and its capacity to satisfy those needs, rather than upon what some other city has done or is doing. To be satisfied with the Whittier, Franklin, Columbus, Hawthorne, Le Conte, and McKinley schools because they are far better than the poorest schools in Baltimore, would be equivalent to saying that we desire our children and our grandchildren to adopt a lower standard of living than we are now enjoying.

The warning that is taken from the facts brought out is that if taken in time Berkeley can prevent what has happened in many of our older cities where replacement of school buildings has been so long delayed that now many generations are doomed to receive their training in school buildings that are not fit places for human beings to live in.

Specifically the evidence here presented shows that Berkeley has followed a wrong policy in establishing so many separate elementary schools, nearly twice the number desirable from the standpoint of either good instruction or sound economy. To correct this the number should be reduced. A systematic plan for accomplishing this will be presented in Chapter VI. The evidence shows that from the standpoint of good organization, the Columbus and Hawthorne buildings are both out of place. Fortunately neither of these plants is worth repairing, so their abandonment

is a practical possibility. The Franklin and Whittier have likewise practically reached the end of their usefulness. It shows that in trying to keep pace with the demands for room the policy of using temporary structures has been carried to too great an extreme, with the result that relatively too large a percentage of the schools need immediate attention in the form of extension or entire new buildings. It shows that water systems, toilets, and heating facilities are in need of repairs or replacement in a relatively large number of the schools. In the matter of additional land at least three junior high schools need large additions, and some additions are needed in six of the elementary schools.

This chapter has attempted to evaluate the school plant as it stands and with reference to the aims and plans of instruction now in use. These aims and plans are fully sanctioned by this survey; and the constructive proposals to be presented later in the report will assume that the present objectives and policies will continue in effect. This means that the next step calls for the best possible readjustment of present plant facilities to these purposes, and for an expansion and revision of the plant with reference to the estimated additions to the school population.

Our next step will be, therefore, to present estimates of what these additional needs will be through the next decade.

CHAPTER IV

ESTIMATED EXPANSION OF BUILDING NEEDS

I. THE PROBLEM OF MEETING ACCUMULATED NEEDS

THE PROBLEM OF BUILDING NEEDS. The need for additional school plant facilities will increase in any city because of the action of three factors. These factors are time and use, which cause buildings to decay and wear out; obsolescence, which makes a building useless for school purposes; and the growth of enrollment, which requires more room. In Berkeley these three factors have been at work from the beginning and, because their effects have been allowed to accumulate, and the city now finds an added demand to care for these accumulations.

Ideally, from the standpoint of good education and good business, schoolhouse construction should exactly keep pace with the demand created by these three factors. The problem of this survey is to suggest a plan for taking up the present accumulated slack, and a plan for preventing future similar accumulations. The problem of this chapter will be to present estimates of what the present slack amounts to, and the extent of the normal demand by years through a period of one decade or to 1936.

BASIS OF JUDGMENT. In Chapter II the present aims and plans of Berkeley's schools were examined as a basis for judging the adequacy of the present school plant in terms of the requirements of a modern scheme of instruction. In Chapter III estimates of the worth of the plant as it now stands were set forth. The facts presented in those two chapters show that Berkeley has suitable aims and plans of instruction, but that the elementary school work is broken up into too many independent units.

With that one objection to the present scheme of instruction it was suggested that Berkeley could wisely project a building program for the schools, keeping to the present general conception of education and the present aims, organization, and curricula.

EVIDENCE OF PRESENT ACCUMULATED NEEDS. It was shown in Chapter III that at various points the present school plant is quite inadequate in classrooms, far more inadequate still in special rooms, short on play space, and antiquated or lacking at many points in toilet and other service facilities. In other words

there is at the present time a substantial amount of slack to be taken up in Berkeley's school plant. It would require the equivalent of two fair sized buildings to replace the many temporary structures that have accumulated in the past decade. It would require at least one building next year to care for the classes housed in over-crowded rooms or rooms that ought not to be used for classrooms. And, to provide special rooms enough to bring present buildings up to good service would call for the equivalent of another building at least. In other words there is need for this much new construction to cover immediate accumulated needs for housing. These needs are scattered about so that there are only a few of the 22 school plants not in actual need at the present time.

THE PROBLEM OF REPLACEMENT. Beyond this lack of space, however, it was shown that a replacement program is already demanding attention. The Hawthorne and Columbus schools should be abandoned as soon as possible, as also should the old Longfellow and old Jefferson. The Whittier is really unfit for use and impossible to revise at a reasonable cost. The Franklin is good for a short time only, and this is also true of the McKinley and the Le Conte and the Washington buildings.

BERKELEY'S VIEWPOINT. If we put these two sets of facts, or these two types of needs, together we cannot deny the fact that Berkeley's good showing when compared with other cities (Table XVIII) is an advantage that is more apparent than real. In other words we can call Berkeley's position good only when we compare it with very low standards. The actual present needs cannot be denied nor covered up by saying that Berkeley is better off than Baltimore. We should rather say that Berkeley is not yet as badly off as is Baltimore. Berkeley taxpayers must think of Berkeley children and of their own obvious needs, and not of the poverty, or the mistakes, or the low ideals, or the poor taste of some other city as the basis for judging what they want their board of education to do in the way of schoolhouse construction.

2. THE PROBLEM OF EXPANDING NEEDS

FACTORS OF POPULATION GROWTH AND BUILDING DECAY. Still another angle to this problem appears when we consider that Berkeley is a growing city. While buildings are getting old and falling into decay on the one hand, the number of pupils is in-

creasing on the other. Once a city has brought its buildings fully up to needs it has the task of keeping that position by adding buildings as rapidly as pupils increase in numbers and old buildings become useless. There is no standing still, not even in a static or declining population.

What is needed in all our cities is the establishment of this simple idea in the minds of the people. A sudden spurt followed by a long period of complacency and self-satisfaction brings us poor school buildings. A regular and constant program of construction and maintenance brings us good buildings. This attitude of complacency almost invariably follows over-exertion in any line and almost any one of our older American cities furnishes illustrations of how this works in building schools.

There are other reasons, too, why these factors of population increase and building decay ought to be met with regularity instead of at intervals. First, a superintendent has four important problems: the formulation of an educational policy; the converting of this policy into a working program; the development of a staff organization for carrying out the program; and finally, housing the program. There is no such thing as a competent policy or program that lacks order and continuity. The whole scheme of things must be tied together in unity. A school building is so intimately connected with the instructional program that it is almost literally a part of it. Obviously then, if the building is to be out of adjustment with the program for about seven of every ten years it is impossible to get satisfactory policies or satisfactory results in our schools. Further, this misadjustment means much harder work in the schools; it means more formal procedure; it means poorer staff coordination; it means general instability throughout the system.

This lack of adjustment is also a problem of economy. It costs far more to put through a big program of construction where things have to be done quickly, and very often by people who have had too little experience. It costs more, too, when we must borrow large sums of money and pay interest through a long period of years. Berkeley's experience in these matters, as will be shown later, (see Figure 17) is very convincing.

BERKELEY'S GROWTH. In 1908-09 Berkeley reported 6676 pupils.¹ In 1926 this figure had mounted to 14,895. This is an average annual increase of 485 pupils through a period of 17 years.

During the past year this increase has been 1364, of which 305 were senior high school pupils, 316 were junior high school pupils, and 743 were kindergarten and elementary school pupils. This is merely to indicate the rate at which growth has been taking place.

To express this in terms of building needs we could say that, on an average during the past 17 years Berkeley has needed to add about 14 classrooms a year. The increase of the year just closed would alone require an addition of about 18 junior and senior high school classrooms and at least 21 kindergarten and elementary classrooms. When one reviews these sample illustrations it becomes clear that expansion is a real and a growing problem in Berkeley.

HOW TO MEET BUILDING NEEDS. One way to meet this need is to add temporary cottages and overcrowd numerous classrooms, and do without the facilities needed to make the school policies effective. This period of neglect will then be followed by a hasty and extensive program of building. Another way is to do some building each year, keeping permanent construction up with the needs. The former results in poor service as noted above, and finally ends in a building program that can be met only by the city going in debt. The other would mean good results in work, and would at least have some chance of being met on a cash basis, which is better economy.

The growth of school population is thus a problem of maintaining educational efficiency and a problem of financial economy. Promptly and regularly met it is easily solved and diverts little of the energy of school officers from their instructional duties. Met at irregular intervals it means makeshift methods and diversions of interest and energy of pupils and teachers from their proper concerns. Again, from the standpoint of economy, the latter method is undoubtedly wasteful.

DETERIORATION OF BUILDINGS. A plant begins to decay and to wear out the moment the materials are in place and in use. How long a building will last will depend upon the materials used and the character of construction. It will depend, too, upon the maintenance service. It is possible roughly to estimate the life of any building. In private business this is a common and a necessary practice. The Whittier building was constructed 34 years ago and

¹ State enrollment of regular day pupils.

is now at a point where it should be abandoned. This is due, not to the fact that the building is completely worn out, but in part to the fact that the alterations necessary to correct the effects of deterioration and of obsolescence together would cost more than the plant would then be worth. The fact is that a wooden building of that character, even with good care, cannot be expected to last more than about 35 to 40 years at the most.

If we apply this to Berkeley's buildings, making reasonable allowance for good, fair, and poor materials and construction, and similar allowances for the possibilities of alterations to overcome obsolescence, we would then have the anticipated approximate dates for abandonment of the present buildings as set forth in Table XXV, which shows the buildings arranged in order of the estimated date of abandonment.

TABLE XXV

BERKELEY'S SCHOOL BUILDINGS WITH DATE OF CONSTRUCTION AND ESTIMATED DATE OF ABANDONMENT

School	Date of Construction	Approx. Date for Abandonment	Est. Years of Service Remaining
Columbus.....	1892 (Main Bldg.)	1927	1
Cragmont.....	Temporary	1926	0
Emerson.....	1906	1940	14
Franklin.....	1895	1930	4
Hawthorne.....	1909	1927	1
Hillside.....	1926	1971	45
Jefferson.....	1922 New Unit	1962	36
Jefferson.....	1906 Old Bldg.	1928	2
John Muir.....	1916, 17, 20	1965	39
Le Conte.....	1892	1930	4
Lincoln.....	1921-22	1980	44
Longfellow.....	1922-23 Brick	1980	44
Longfellow.....	1897 Old Bldg.	1927	1
McKinley.....	1896	1930	4
Oxford.....	1909	1950	24
Washington.....	1906	1935	9
Whittier.....	1892	1928	2
Thousand Oaks.....	1918	1960	34
University Elementary.....	1916	1946	20
Burbank.....	1916	1956	30
Edison.....	1916	1970	44
Garfield.....	1922	1962	36
Willard.....	1916	1965	39
High.....	1922 Academic	.....	?
Old Brick.....	1901 Grove St.	1931	5
Science, H. S.....	1908	.....	.....

It must be understood that these dates are simply estimates, such as are commonly made by architects. They are based upon the judgments of three people. They have taken account not only of the problems of wear and tear, but also of the possibility of altering the interior of the building to adjust various spaces to new uses when the educational program requires it. They have assumed, too, that the buildings would receive repairs as needed and also reasonable care and protection.

The dates here set down for abandonment may be regarded as approximately the dates upon which Berkeley's replacement program must be based. It can be assumed reasonably that the city should not expect these estimates to fall below oftener than they fall above what experience will show to be desirable. Several factors will enter to shift these dates upward or downward for as much as from one to five years from the dates upon which the estimates fall. The rate of growth of the school enrollment, financial conditions, changes in educational programs, and loss from fire, are factors that are likely to operate to shift these dates to positions above or below these estimates. In spite of this, however, all these buildings have limited lives, and this shift is a minor matter when viewed through a period of a half century.

3. THE PRESENT LACK OF SPACE

HIGH SCHOOL SPACE NEEDED. It has been stated that in the high schools there are many overcrowded classrooms. It was explained that this was due not so much to large classes, but largely to very small classrooms, and to the fact that various places are being used for classrooms that were designed for some other purposes. This shortage in space in all high schools was stressed as a pressing matter.

It is difficult to state precisely the number of new rooms that would be required to care for this congestion because congestion is only part of the problem. Along with congestion goes the question of proper size of classes, the desired expansion or changes in courses that would be effected if rooms permitted, and the types of rooms that would be released by the addition of new rooms.

Berkeley's high school classes are in general the right size. Every large high school will have a few classes that are very large or very small, but Berkeley has done reasonably well in this respect. To overcome crowded rooms must not mean to reduce the

size of classes. To do so is not required for educational reasons, and any such reduction means increased cost.

What to do with the 20 or more undersized rooms in the high school plants will be in part a problem of administration for the principals of these schools to solve, and in part a problem of alterations in partitions. Some of these small rooms can be used and should be retained. Where partitions can be changed at reasonable cost it will be cheaper to do this than to pay the added cost of teaching smaller classes. It is recommended, therefore, that the possibilities of such alterations be given attention.

In proportion as these rooms can be brought into better service they will satisfy a health and an educational need; but this will not solve the problem of additional room. The number of these readjustments that can be made will be a problem for an architect or builder to determine.

Some, but by no means all, of the undersized classrooms are in temporary buildings. Together the four junior high schools are using a total of 29 temporary rooms, many of which are large enough for only 20 pupils. To replace all these temporary structures with permanent construction should be regarded as an immediate need. A rough estimate of the number of classrooms needed now to relieve crowded conditions in the high schools and to do away with temporary rooms would be approximately 40. This does not include the need for special rooms. The need for auditorium and gymnasium space is pressing. Cafeterias, laboratories, shops, and offices, all suggest other points at which the high school buildings are actually overcrowded at the present time.

ELEMENTARY SCHOOL NEEDS. The needs in the elementary schools are of a similar character. The Lincoln, Longfellow, Thousand Oaks, Franklin, Jefferson, Whittier, and Washington are all in need of more classrooms. Special rooms are lacking or very poor in at least half of the schools.

If we divide the enrollment by 35 we would say that, except for the large number of temporary rooms, all the elementary schools have rooms enough. In reality, as already shown, the small school has made for small classes, and accordingly for relatively more classrooms. This accounts for shortage at some points though in a few cases there are actually too many children now for the rooms available.

Space will not be taken here with an attempt to give an exact estimate of the present amount of overcrowding since in the elementary schools overcrowding is not as serious a matter as is that of temporary and very poor housing. Overcrowding, so far as classrooms is concerned, has been met quite regularly by adding more temporary cottages. The elementary schools are now occupying 190 permanent rooms and 73 temporary ones. That is, over 27 percent of the children are now housed in temporary structures.

4. THE GROWTH OF POPULATION

It has been shown that there is urgent need for new construction to meet present accumulated needs, which are the natural results of wear and tear, of a growing school program, and of growth in school population. Estimates of the rate at which new future construction will be needed to replace loss of buildings from use, decay, and obsolescence have also been presented. It remains here to set up estimates of the rate of growth of the school population, and of the demand this increase will make for additional school buildings.

METHODS OF ESTIMATING POPULATION INCREASE. There is no certain method by which we may accurately judge the future growth of a city in the matter of population or wealth. Numerous formulae have been devised and used by individuals and corporations for determining the rate of business expansions, and for determining the place to erect buildings or establish car lines, water and gas mains, or telephone lines. It seems reasonable to assume that if such estimates are a safe basis upon which to invest money for private gain they should serve equally well as a basis for investing public funds in school buildings. These methods assume that the ratio of water or telephone, or gas, or electric users and consumers to the total population will remain approximately constant from year to year.

The United States Census Bureau estimates future population growth in terms of past growth. For the country as a whole, or for a state, or in many cases for a single city, this census method has proved to be quite accurate. Naturally this method takes no account of the effect of future inventions, sudden changes in laws, or new trends in business and industrial development, except as they reach into the past. It depends on a past count of people

only. This method assumes that the population increase of any one year is one-tenth of the increase of the next previous census decennium. That is, the population increase in 1926 is estimated to be one-tenth of the difference between the population of 1910 and that of 1920.

This survey has made use of these methods, as will be seen in the following tables. It has considered also the ratio of school to total population as another method. On the basis of these studies an estimate of the growth in school population through a period of ten years has been prepared and is offered here as a means of estimating the additional needs for school buildings through this period.

It is entirely conceivable that Berkeley has grown and will continue to grow faster than any of these estimates would indicate. With the continuous expansion of the State University, with the substantial beginning of an industrial section, with the popularity of the city as a choice place of residence for the Bay region, there is surely no reason to expect its rate of growth to flag. The present business expansion is an indication of what investors think of Berkeley's future. However, it is better to build schools with a reasonably conservative estimate in mind, and for that reason this survey accepts an average of several estimates rather than the highest one as the basis of its recommendations.

TOTAL POPULATION ESTIMATES. Estimates of the growth of population increase are an index to the size of school enrollment and, in some measure at least, to the increase in taxable wealth.

In Table XXVI are presented estimates of the present population and of the increase by years to 1936. These estimates are based upon computations made by five different methods. In column 6 the average of these estimates is shown, and in column 7 is presented an estimate of the school enrollment for grades 1 to 6 inclusive.

Column 1 in this table shows the census for 1910 and for 1920, and these are followed by figures that are based upon the Federal census method of estimating population increase. That is, one-tenth of the 1910 to 1920 increase is added for each year for column 1 (see footnote to table). This brings the 1926 population to 67,717. Extending this for another decade we get an estimated population of 85,085 for 1936.

TABLE XXVI
POPULATION ESTIMATES FOR THE CITY OF BERKELEY
1926-1936

METHOD OF COMPUTING ESTIMATES							
Year	Census Bureau ¹	Ratio of Oct. Enrol. in Grades 1-6 to Total Population ³ 9.3%	Gas Consumers ⁴ (Ratio 3.8)	Electric Consumers ⁵ (Ratio 4.0)	East Bay Water Co. ⁶ (Ratio 4.5)	Average of Previous Figures	9.3% of the Average of Estimates or the Estimated Pop. for Grades 1-6
1910	40,434	40,434	40,434	40,434	40,434	40,434	.....
1920	57,295	57,295	57,295	57,295	57,295	57,295	.....
1921	59,032	58,290	.....	.....	.....	.....	.....
1922	60,769	60,333	.....	.....	.....	.....	.....
1923	62,506	61,742	.....	.....	.....	.....	.....
1924	64,243	63,387	.....	.....	.....	.....	.....
1925	65,980	64,527	.....	.....	.....	.....	.....
1926	67,717	66,133	78,037 ⁴	87,392 ⁵	88,972 ⁶	77,650	7221
1927	69,453	67,739 ²	80,388 ²	90,327 ²	92,006 ²	79,983	7438
1928	71,189	69,346	82,739	93,262	95,039	82,315	7640
1929	72,926	70,952	85,091	96,197	98,073	84,648	7872
1930	74,663	72,558	87,442	99,132	101,106	86,980	8089
1931	76,400	74,164	89,793	102,067	104,140	89,313	8306
1932	78,137	75,770	92,144	105,001	107,174	91,645	8523
1933	79,874	77,377	94,495	107,936	110,207	93,978	8740
1934	81,611	78,983	96,847	110,871	113,241	96,311	8957
1935	83,348	80,589	99,198	113,806	116,274	98,643	9174
1936	85,085	82,195	101,549	116,741	119,308	100,976	9391

1. In 1920 the time of taking the census was changed from April 15 to January 1. The 1910 to 1920 increase is therefore the increase of 116.5 months instead of 10 years or 120 months.

2. This and subsequent figures in this column were derived by census method (1926 estimate minus 1910 population, divided by number of years since 1910).

3. In 1910 the enrollment in grades 1 to 6 inclusive, amounted to 9.49 percent of the population. In 1920 the ratio was 9.31%. Since we know in general that compulsory school laws are bringing a larger percentage of children into school, and since Table 1 shows that the part of our population under 5 years is decreasing and the part above 65 is increasing, it is fair to assume that this ratio will go down rather than up. For this reason I have used the 9.3 ratio for this estimate. It must be regarded as a conservative estimate.

4. Number of consumers in 1920 was 15,035 or a ratio population to consumers of 3.8. In 1926 there are 20,565 consumers giving an estimated population of 78,037.

5. Number of consumers in 1920 was 14,230, or a ratio of 4.0. In 1926 there are 21,848 consumers, giving an estimated population of 87,392.

Above data by courtesy of W. G. Vincent, Vice President, and Executive Engineer of Pacific Gas and Electric Co.

6. Used the 1922 census estimate of population, Berkeley and Albany combined, to obtain ratio of 4.5, e.g. $\frac{63,561}{14,100} = 4.5$. In 1926 the number of consumers was 20,660. The figures include the Albany population and also the Albany water meters. Assuming that the ratio of Albany to Berkeley population was the same in 1926 as in 1920 this gives an estimated population of 88,972 for Berkeley.

Column 2 of this table shows an estimate based upon the ratio of school to total population. During the years 1918 to 1925, using the 1920 census as a basis, it was found that the ratio of total population to enrollment in grades 1 to 6 inclusive, ranged from 9.6 to 8.8. In 1910 the ratio was 9.49. The tendency of the ratio was to become smaller, due, no doubt, to the more rapid

increase in the older population groups, or to the relative decline in the proportion of children in the total population, as shown in Table VI.

On the basis of these ratios, assuming that the school enrollment in grades 1 to 6 will be 9.3 percent of the city population, we get the figures for 1921 to 1926 in column 2. The remaining figures of the column were then projected by the census method. By this plan the present estimated population of the city is 66,133 and the 1936 population would be 82,195. It will be seen that these figures are slightly below the census estimates in column 1. This would be expected if the percent of the population composed of school children is on the decrease.

By similar methods the ratios of gas consumers, of electric consumers, and of water meters in use, to the total population in 1920 give us the 1926 estimates in columns 3, 4 and 5, respectively. On the basis of these, the present population is estimated to be 78,037, 87,392 and 88,972. Projecting these three estimates forward we get estimates of 101,549, 116,741, and 119,308 as the 1936 population.

While at present the building permits of the city show, both in number and in amounts involved, that the city is growing rapidly, as also do business expansions, bank clearings, and postoffice receipts; and, while the university is showing a remarkable growth, it seems wiser to assume that an average of the estimates here presented is a reasonable basis upon which to suggest estimates of building requirements. It will be wise, however, to keep in mind that there is good evidence that this estimate is conservative. Building permits issued in 1925 were 3.6 times the number issued in 1920, while the expenditure called for by these permits represented 3.2 times as large an investment. Bank clearings in this five-year period increased by more than 45 percent, and postoffice receipts by more than 58 percent.

In the final column of this table is shown estimates of the enrollment in grades 1 to 6 inclusive based on the assumption that 9.3 percent of the figures in column 6 are in this elementary school group.¹ It may be explained here that the reason why the kindergarten and high school groups were not used is because, by

¹ To get these ratios, the December enrollment figures of one year were used with the January census figures of the year following. This brings the two counts close together.

the effect of compulsory attendance laws high school enrollments have grown quite out of proportion to total population growth. Also, Berkeley has popularized both kindergarten and high school instruction in the past decade and this has affected attendance, making its growth exceptionally high.

In order to simplify comparison of these figures the estimates shown in columns 1 to 6 inclusive are shown graphically in Fig. 6. From this diagram it will be seen that the higher estimates call for a very marked change in the direction of the curve after 1920. While, as already noted, there is reason to think that a substantial shift in this direction is taking place there may be some question as to whether it is as large as these upper curves indicate.

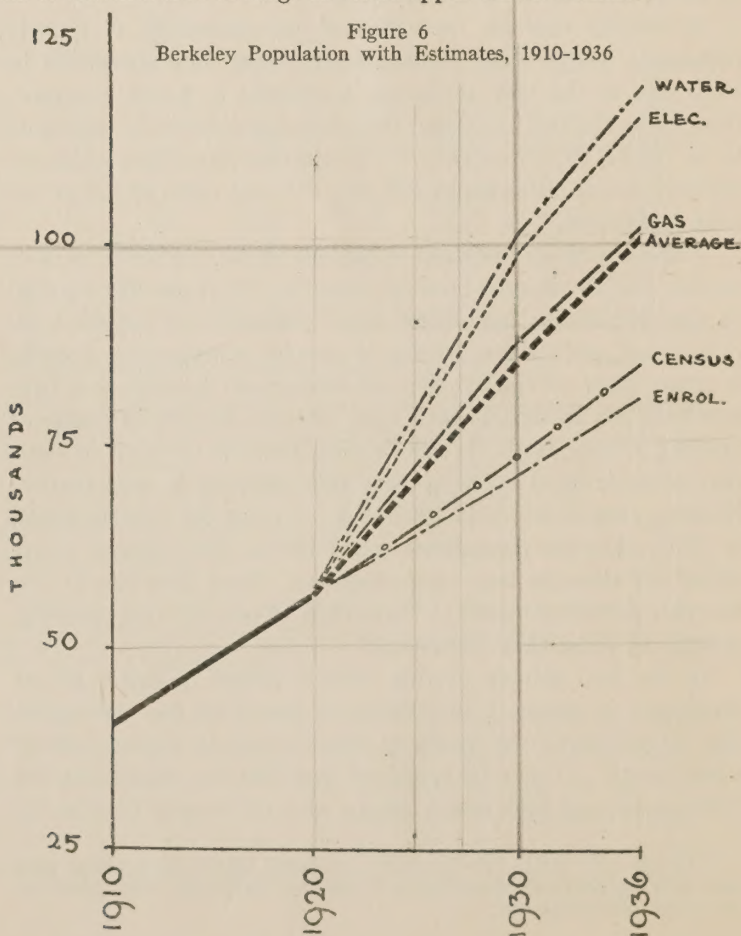


TABLE XXVII

BERKELEY SCHOOL ENROLLMENT FIGURES WITH ESTIMATED INCREASE TO 1936

(Figures from State reports)

YEAR	Kindergarten Enroll	Enroll Gr. 1-6	Enroll Gr. 7-9	Enroll Gr. 10-12	Total Enroll Except P. T. and Eve.
1908-09.....		4223	1642	811	6676
1909-10.....		4257	1659	1044	6960
1910-11.....		4272	1594	1051	6917
1911-12.....		4357	1562	1010	6929
1912-13.....	51	4859	1733	1189	7832
1913-14.....	223	4946	1986	1238	8993
1914-15.....	649	4902	1892	1074	8517
1915-16.....	674	5554	1882	1036	9146
1916-17.....	727	5976	2052	1035	9790
1917-18.....	842	5556	2065	1013	9476
1918-19.....	831	5968	2410	1040	10249
1919-20.....	846	5918	2440	1380	10584
1920-21.....	982	6004	2547	1369	10902
1921-22.....	974	6038	2796	1604	11412
1922-23.....	966	6257	3150	1799	12172
1923-24.....	1113	6371	3479	2027	12990
1924-25.....	1133	6587	3602	2209	13531
1925-26.....	1241	7222	3918	2514	14895
1926-27.....	1295	7398	4052	2614	15378
1927-28.....	1349	7575	4186	2714	15862
1928-29.....	1404	7751	4320	2814	16345
1929-30.....	1457	7928	4454	2914	16829
1930-31.....	1511	8104	4588	3014	17312
1931-32.....	1565	8270	4722	3114	17796
1932-33.....	1619	8447	4856	3214	18279
1933-34.....	1673	8623	4990	3314	18736
1934-35.....	1727	8800	5124	3414	19246
1935-36.....	1781	8976	5258	3514	19730
% Increase 1910-11 to 1915-16.....		30	18	1	32
% Increase 1915-16 to 1920-21.....	45	8	35	32	19
% Increase 1920-21 to 1925-26.....	26	23	54	83	36
% Increase 1909-26	91	71	138	209	123

5. THE GROWTH OF SCHOOL POPULATION

SCHOOL POPULATION ESTIMATES. So far as the elementary schools are concerned, it is believed that the figures in column 7 of Table XXVI provide a satisfactory estimate of the housing requirements of the next decade. The elementary school group is and has long been a stable group. The other groups have not yet reached the point where their enrollments include all that are legally entitled to training. There is reason to think, however, that this point of saturation has been nearly reached, and we may be quite sure that the rate of increase through the coming decade will be lower than it has been in the past decade. Even with full enforcement of attendance requirements, the growth of the university, and the growing popularity of secondary and higher education are bound to bring relatively larger increases to the high than to elementary schools. It is believed, therefore, that the census method of estimating the growth of these groups, as applied here, will be fairly dependable.

Table XXVII, based upon state enrollment figures, shows the actual enrollment by groups for the years 1909 to 1926 inclusive, with census estimates for the years following, to and including 1935-36. At the bottom of the table is shown the percentage of increase during each of the last three five-year periods and finally for the entire period covered by the table.

The rates of growth have fluctuated and they are different for each of the groups; yet, one point is clear: So far as high school groups are concerned, the rates have increased. The senior high school enrollment actually fell off by one percent between 1911 and 1916, but in the next five years it increased by 32 percent, and in the five years just closed by 83 percent. The junior high school group gained 18 percent from 1911 to 1916, 35 percent from 1916 to 1921, and 54 percent in the last five years. The elementary group, on the contrary, had a substantial decline in rate of growth from 1916 to 1921 and through it has made rapid growth in the past five years it has not regained its 1911 to 1916 rate. The kindergarten figures merely reflect the rate at which this institution was accepted by the people as a part of the school system. Its rate of growth in the past five years, however, was only slightly larger than that for grades 1 to 6, which shows that this is now a stable part of the school population. The total

column reflects the sudden spurt given by the kindergarten in its early years, but otherwise it shows that the recent years are the years of rapid increase.

In the final line of the table is shown the increase for the entire period covered by the table. Between 1915 and 1926 the kindergarten group increased by 91 percent. In the past 17 years the elementary group increased by 71 percent, the junior high school group by 138 percent, and the senior high school group by 209 percent. Taken together the school population increased by a total of 123 percent.

There is nothing in these figures, therefore, to suggest that the rate of increase is likely to show a serious decline. The kindergarten estimates are based upon the average increase during the past 11 years. For the high school groups and all others, upon the last 17 years. This group gives far more conservative rates of growth than we would get by using the past 10 years.

Of course the increases of the next 17 years will not be likely to show a duplication of these percentages. We know in reason that from now on the increase must come almost solely from total population increase. The slack is mostly taken up.

To project these columns forward from 1926 on the basis of the 17 years of records rather than upon that of the past 10 years, is to recognize that recent years cover a spurt in growth that will not be repeated. In using the 17-year period we get a rate of increase that is effected by the early years when attendance was low for the total population, as well as recent years when it has been high. It would seem, then, that insofar as the census method is a safe basis this use of it should give us trustworthy estimates for the future.

The figures of this table are shown graphically in Fig. 7, from which a visual impression of these trends may be had. The curve for the elementary group is plotted for the figures of this table and also for the estimate presented in column 7 of Table XXVI.

Corresponding rise in the other curves would appear if plotted. Inasmuch as we are quite certain that the divergence would likely be greater rather than less than is shown for the elementary group, we may permit this single case to serve as a conservative sample illustration.

According to these estimates the city will, in 1936, have 1781 kindergarten children, or more than a 43 percent increase over the

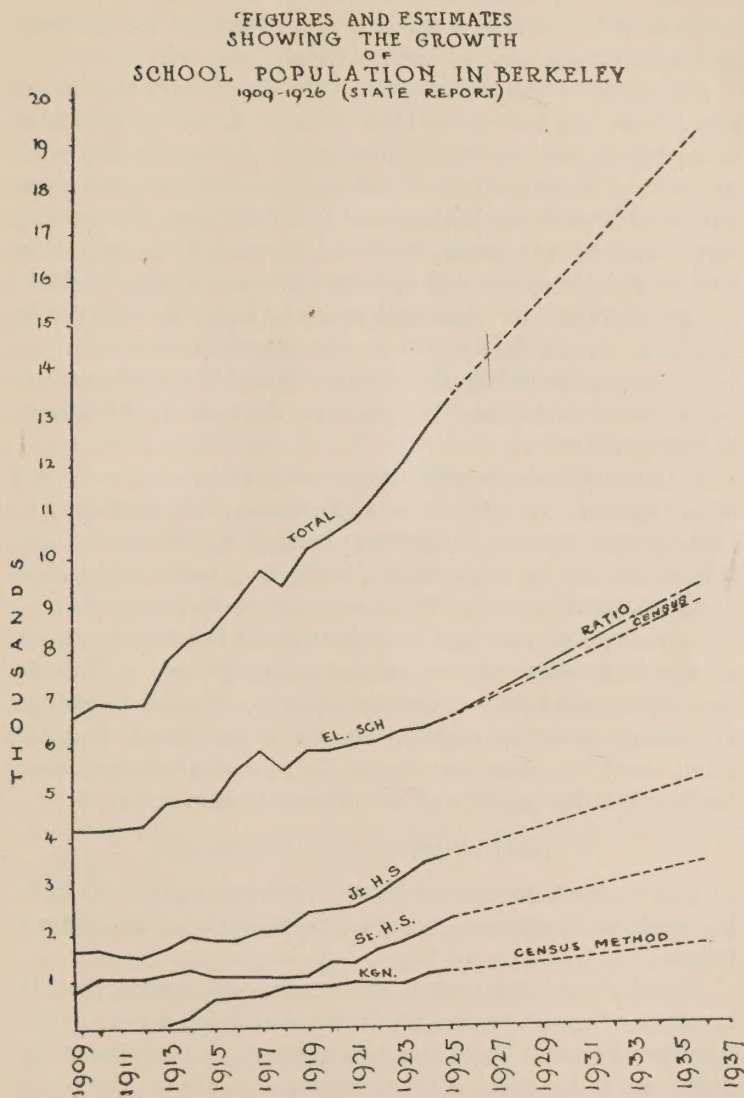


Figure 7

Figures and estimates showing the growth in Berkeley's school population, 1909-1926.

present. Corresponding increases for the other groups are 24 percent for the junior high school group; 39 percent for the senior high school group; and 32 percent for all combined.

This gives us 540 kindergarten, 1754 elementary, 1340 junior high school, and 1000 senior high school, or a total of 4835 additional pupils that are to be absorbed in the coming ten years. As between the elementary school estimates here and that shown in column 7 of Table XXVI there is a difference, this estimate being lower by 415 pupils, or by 4.6 percent. If we adjust the total on the assumption that this difference would apply in all the groups alike then our 1936 total would be larger by 908, making it 20,638. In the light of the percent figures at the foot of our table even this would be conservative. Probably 21,000 would be approximately the total if computed on the basis of the estimate in Table XXVI.

If this increase were expressed in terms of required housing it would represent an addition of approximately 18 classrooms for kindergartens, 62 for elementary schools, 45 for junior high schools, and 33 for senior high schools, or a total of 158 classrooms during the decade. When we consider the offices, the gymnasias, the auditoriums, and the other special features that would go with these rooms, we have at least a rough picture of the building demands that will be necessary, not to replace old buildings, but merely to care for expected increase in enrollment. In school plants these 158 classrooms suggest the equivalent of about seven buildings of the capacity of the present Lincoln school.

6. TOTAL BUILDING NEEDS SUMMARIZED

THE FACTORS AFFECTING NEED. To bring together the building needs of the present and near future we may summarize as follows:

Berkeley's needs for additional housing will depend upon the operation of certain factors, the influence of which may be at least roughly estimated. These factors are: wear and tear, due to use; decay, due to the effect of the elements; obsolescence, due to lack of adjustability of a building to changing needs; and growth of school enrollment, due to growth of the city's population and to the fuller use of the schools by the people.

BERKELEY'S CONTROL OF THESE FACTORS. These factors have all been at work in the past and will continue. They may be held

in check to some extent, and this is a matter of importance both economically and educationally. Wear and tear and decay can be held in check by proper maintenance. In this Berkeley's schools have fared well. These two factors may be held in check, too, by exercising care in the selection of materials and by insisting upon high quality of construction. The Whittier basement play rooms cost nearly as much as they would have cost had they been properly constructed. The Whittier, the Le Conte, the old Longfellow and Jefferson, and the Franklin all show poor quality of construction, and poor materials were used for floors and at some other points in more recent construction. It is very doubtful if this is economy. The dry rot recently found at work in at least two buildings could have been prevented by proper care in construction. Obsolescence, such as the auditoriums in the several high schools, or the useless small rooms, and the inadequate offices, can be resisted by proper study of future needs before building plans are accepted, and especially by seeing to it that the interior of every building is thoroughly elastic in its construction. As to population increase, we, of course, have no interest in checking, but we can meet it more economically if we try to anticipate it.

It would be fair to say that in maintenance Berkeley has done well. In anticipating future needs, in the selection of building materials, in quality of workmanship, and in caring for elasticity of interior construction, many mistakes have been made that might have been avoided.

THE EFFECT OF THESE FACTORS ON BERKELEY'S BUILDINGS. To bring together the needs that have been suggested by this study we may say:

1. Due to the fact that the city has not kept pace with the influence of these factors a substantial need has accumulated and is now met by temporary cottages and by overcrowded classrooms. This accumulated need is here estimated to be the equivalent of two school plants the equal of the present Lincoln.

2. Estimated needs of the coming decade due to the effects of decay, wear and tear, and obsolescence, beginning at the present time will require, according to Table XXV, a replacement of construction to care for the present Columbus, Hawthorne, Whittier, Franklin, old Longfellow, old Jefferson, Le Conte, McKinley, Washington, the Grove Street building, high school shops, domestic science and art buildings, and temporary buildings at all other schools.

3. Estimated needs that will arise from the increase in population from 1926 to 1936 will require the equivalent of about seven plants equal to the present Lincoln plant.

7. BERKELEY'S PRESENT SITUATION ILLUSTRATED

In order to illustrate the reasoning and the facts set forth above Fig. 8 is presented. It shows in a simple way how the factors that create need for buildings operate as time passes, and in particular, how Berkeley now stands.

This figure is offered as an illustration only, and not as a mathematical expression of Berkeley's need for school buildings. The explanation is simple.

The distance YA on the line YO indicates the number of children Berkeley has to house now, 1926.

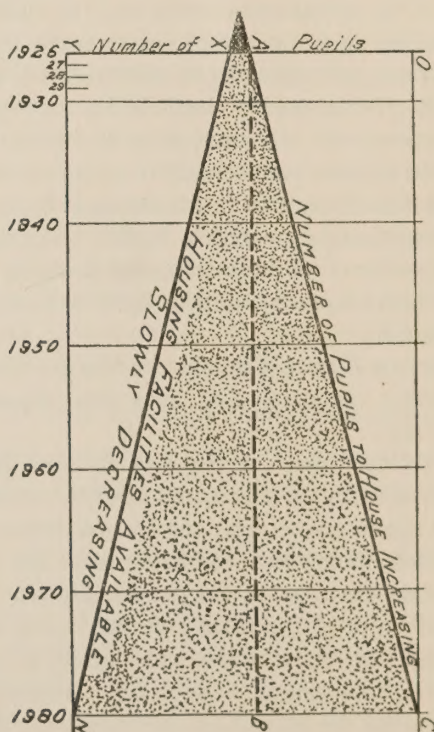


Figure 8

Illustrating the growth of school building needs and the effect of neglect in meeting them.

The line YN is to mark the passage of time from 1926 to 1980.

The line XN is to represent the Berkeley school plant as it now stands and to show how it is slowly wearing out and being abandoned.

At the beginning (1926) the plant is not quite able properly to care for all pupils. The distance from X up to A shows how far the buildings are behind present needs.

Except for the two or three cement buildings, the present plant alone, according to the survey's estimate, (see Table XXV) will be wholly abandoned and gone in 1980.

If the school population should remain constant for these next 54 years then the line AB would show the population, and the distance between AB and XN would indicate the need for housing, or the number of pupils not provided for. This distance is small in 1926, larger in 1930, and larger still at the end of each decade following, until finally there are no buildings left.

The population, however, does not remain constant, but grows, as illustrated by the upward slant of the line AC.

Without any new buildings or replacements the shaded area, XACN, and not the area XABN, would represent the unsatisfied need for housing through these years. Each year the distance between the lines AC and XN widens, because all the factors that produce need—wear and tear, decay, obsolescence, and population increase—are at work in this illustration.

To keep pace with the need the line XN must be lifted by new construction to a position where it coincides with line AC, that is, to where it fully meets the need. The problem now is to reduce the distance XA to zero and keep it zero.

Obviously when we begin to build we should not build for the present need solely, but somewhat beyond it. For instance, we should not build now to cover XA but to cover slightly more than this. By so doing we anticipate the need a little before it comes. That is, in 1926 we should build with reference to the anticipated requirements of 1930 or 1931, and so on each year.

Our problem then is to keep the line XN slightly above the line AC. To do this we must replace buildings as fast as they are abandoned, and build new ones for the additional children. Instead of allowing XN to slant downward it must be kept rising all the while. In other words, this dark wedge of unsatisfied need must not be allowed further to establish itself.

This picture is illustrative of past history in many cities. Baltimore and Atlanta were shown by their surveys to be where this picture indicates that Berkeley would be about 1935 or 1940, if the schools were set adrift with what they have and no new buildings were added.

In this picture Berkeley is now on the left margin. X has fallen below A and the blackened edge of the wedge is well set in the Berkeley schools. By prompt and vigorous action it may be withdrawn and points X and A brought together. If long neglected, this will be impossible to accomplish. The consequences of permitting this gap to establish itself are serious, both educationally and economically. This wedge of neglect and indifference and parsimony has been driven deep into the educational history of many American cities. The people of Berkeley must realize that its edge is now well set in Berkeley's school system. To close or not to close that gap is the question.

To answer this question we must know:

1. What it will cost to close this gap.
2. Whether the city is now able to pay that cost.
3. Specifically what building is required to close it.
4. What is the best way to finance the project.

This report will turn next to a consideration of Berkeley's ability to pay for schools, and will then outline what action is recommended, and finally a plan for financing the program.

CHAPTER V

BERKELEY'S ABILITY TO FINANCE SCHOOLS

I. THE FACTORS THAT CONSTITUTE ABILITY

WEALTH AND DESIRE FOR GOOD SCHOOLS. From the facts set forth above it is clear that school building needs have been accumulating in Berkeley for several years, and that at present these needs are urgent at many points. If this shortage is to be satisfied at once it will have to be by a very sharp rise in tax rates, or by bonding the district, and so spreading the cost over a period of years. The question to be dealt with here is: Is Berkeley able financially to close the gap described in Chapter IV, which marks the extent to which the school building needs have accumulated?

In answering this question there are two points to consider. First, do the people of the city desire to have a modern school system with a modern school plant, or are they willing to accept a lower standard and be content with mediocre buildings? Second, if they desire a high class school system, can they actually afford it?

As to the first point, only the people of Berkeley can answer. This is a question of social and intellectual standards. The schools of any city undoubtedly do express the intellectual and social aspirations of the people. Where these aspirations are low schools are generally poor. Where they are high schools are good. In view of the purposes for which public schools were originally established in America, and in view of the gradual expansion of their service throughout the country's history, it is not strange that people commonly regard the public school system as the best single index to the general character of a city.

WILL TO HAVE WHAT WE WANT. There is little to be gained by trying to argue people into accepting higher standards of culture than they desire. As to what the people of Berkeley desire in public schools, however, no one would long be in doubt. They want the best. What people want, however, they sometimes lack the will or the ingenuity to get, because of the difficulties in the way. It is as important, therefore, that a city believe in its ability to get what it wants, as it is that it shall want what is worth getting. While urging a community to accept higher educational ideals is the equivalent of urging it to try to raise itself by pulling on its

bootstraps, yet, urging it to have the courage to try to get what it wants, and to believe in its ability to get it, is different. This we all need to be told at times, when the load gets heavy. Facts above presented show that Berkeley's educational load is getting heavy; and the slack in the building program might lead one to think that this burden has caused some to hesitate as to the city's ability to carry it.

This survey wishes to point out that, while actual financial ability is an essential factor, yet it is not the sole factor that determines what communities spend for their schools. In public education people decide first what they want, and only in extreme cases does the fact of high cost seem to prevent their getting it.¹ All this, however, may safely be left to the people of Berkeley, whose faith in public schools, and whose will to have good schools are too much in evidence to permit of doubt on this point. And, as to ability to have the best, this report turns to a consideration of the city's actual financial ability, leaving this question of the will, and courage, and ingenuity of the people, with two reminders: First, that these factors unquestionably count for much; second, inability to agree upon a method of action is the equivalent of a lack of ability.

After all is said on this point, it is with communities as it is with individuals. A man of little means but who has the ability to make a decision, and the courage to act, is the man who wins success. The man who has plenty of means but who wavers from one idea or plan to another ends in indecision and dwindling assets. A unified city is apt to reach decisions and to act. A city that is not unified, but that consists of a miscellaneous group of separate communities, each jealously guarding its special rights, will end in indecision and no action. The ability to compromise, to get together, is an essential characteristic of a progressive city.

2. MEASURING FINANCIAL ABILITY

WHAT FINANCIAL ABILITY CONSISTS OF. Financial ability consists of ability to command money values. The community that has the most wealth that can be converted into money can buy the most things. To measure financial ability, then, we must

¹ This statement is based upon an extensive study of school costs in this state. See: *The Cost of Education in California*, by Sears & Cubberly, N. Y., The Macmillan Co., 1924.

know what it is that can be converted into money and how much of these resources a community possesses.

Before proceeding to enumerate these items for Berkeley, we should note that in the management of public, as well as in the management of private business, it is not what is possessed alone at a given moment that counts, but also, those things that constitute potential future wealth. Schools are not of momentary but of constant concern. What we want then is an understanding, not only of present, but also of probable future financial ability.

To list the things that count at any given moment we would include:

1. Actual wealth now possessed, and
2. Credit, or ability to borrow.

The reason for mentioning credit is because credit depends not solely upon the wealth possessed but in part upon what people think of our business ability. Often we can borrow considerably more than 100 percent as much as we own.

Since our needs for money are continuous we must spend more with reference to our ability to reproduce what we spend than with reference to what we have at any given time; that is, our definition of financial ability must finally be written in terms of ability to produce wealth.

As evidence of ability to produce wealth we would mention:

1. Wealth owned, or capital that can be invested.
2. Social net income, or the combined net income of all the people, and
3. Freedom from debt.

What we actually earn is, of course, a fairly accurate measure of our ability to earn more. What wealth we possess is a good indication of, but not an actual measure of this ability, since we do not always invest wisely, and too, income from capital invested in speculative business is uncertain and quite sure to fluctuate in comparison with that invested in a stable business. Other things being equal, however, two cities having the same amounts of wealth will tend roughly to have equal earning power. Debt is the equivalent of a minus sign before the figure representing wealth and, as such, is measurable evidence of lack of wealth, or lack of financial ability.

OTHER INDEXES OF FINANCIAL ABILITY. We cannot get a measure of Berkeley's net social income, so the best single index

for use here cannot be obtained. We can, however, get fairly accurate measures of the city's wealth and of the city's debt from year to year. To this, as a general index we are able to add other evidence of a fairly tangible sort. For instance:

1. The economy with which a city carries on its governmental activities is a rough index of moral stability and of business ability, and these things count in earning capacity.

2. Other things equal, the city with the fewest dependents, young and old, will have the largest number of active earners, and so, probably the largest earning ability.

3. A community with low percentage of illiteracy probably has more intelligence to apply to business and so more than average earning ability.

4. The city with relatively large bank clearings, relatively large postoffice receipts, rapid expansion in business, industry and population is, other things equal, the city with relatively large financial ability.

UNITS FOR MEASURING FINANCIAL ABILITY. From this analysis it is clear that measuring a city's financial ability is not a simple matter. At best we can measure only the signs or indications of this ability and not the ability direct. What we get, then, is an estimate and not an exact measure. This, however, is all we have to guide us in private business. The merchant buys goods in terms of his estimate of the demand. The manufacturer increases the size of his plant with reference to his estimate of the market for his product. The banker estimates the value of a wide variety of properties which he accepts as security for loans. The tax assessor estimates the value of property for taxing purposes. Every mortgage and bond and note is backed by properties, the value of which someone has estimated. Thus, making estimates where we cannot get exact measures is a common practice and, if the methods used were not successful, business would go to pieces. We do depend on these estimates and we have succeeded.

If wealth is an index to financial ability then how shall we measure wealth? Similarly, how may we measure the several other signs of financial ability we have just listed? Is it total wealth, or wealth per capita, or per pupil, or percent of total wealth that gives the best measure of financial ability? For each of the above factors for which data were obtainable commonly accepted units or methods of measure will be applied, and from the results some

evidence of Berkeley's ability to have modern school buildings will be presented.

3. THESE MEASURES APPLIED TO BERKELEY

POPULATION STUDIES. In Chapter II certain facts were presented as a means of judging Berkeley's educational needs. Some of those facts have a bearing also upon the question of financial ability. It was pointed out, first of all, that Berkeley is part of a large cosmopolitan center and is enjoying a rapid growth. It was noted there that because of the State University and of the beautiful contour of this territory Berkeley is growing in popularity as a residence city. It was shown, too, that industries are rapidly establishing themselves along the bay shore as a natural extension of the larger industrial center in Oakland. While Table II showed that in the past decade Berkeley has not grown as rapidly as have some of the southern cities of the state, it has kept pace with western cities, and that with little or no addition of outlying territory.

In the character of this expansion it was shown in Table III that Berkeley is attracting native stock and a rather high class of foreign stock. In occupations there is a relatively high percentage of work requiring intelligence, and the literacy figures of Table V show that Berkeley has relatively few illiterates. It was shown, also, that as compared with western cities Berkeley has not more than an average percentage of children in its population.

These facts all combine to indicate that Berkeley's financial strength is increasing and that in this matter Berkeley has a decidedly healthful prospect. At the same time these figures show that Berkeley does not have an unusually difficult nor extensive educational program. This evidence is entered here, not as proof of great financial strength, but as real symptoms of good financial health and prospect for rapid growth.

BUSINESS DEVELOPMENTS. Another set of general symptoms appear in the following facts. From 1920 to 1925 the bank clearings in Berkeley increased from \$150,987,831 to \$220,021,829, or more than 45 percent. During this same period telephone stations increased from 12,826 to 21,790, or more than 69 percent, and water meters from 13,787 to 21,118, or over 53 percent. Further, in this period building permits calling for expenditure of \$3,115,546 in 1920, and \$10,058,729 in 1925 show a growth of more

than 200 percent; and postoffice receipts grew from \$252,465.27 to \$400,662.66, or more than 58 percent.

These figures all indicate growth, and they are unmistakable signs of a healthful financial condition in the city. Stores, banks, building and loan institutions, hotels, street railways, telephone, gas, water, and electric extensions all take careful note of these very signs, and launch or extend their investments only when these signs are favorable. We only need to look about in Berkeley to see extensions and new developments in practically all these lines that seem to correspond to the favorable showing of these figures on business development and population growth. It is thus very clear that investors believe in Berkeley's business and industrial future. Business and industry mean wealth and so ability to finance the city's need for schools.

BERKELEY'S ASSESSED WEALTH. Perhaps the most satisfactory basis for judging a city's financial ability is by its wealth. The best basis for an estimate of this wealth is the taxable property. There are two assessment rolls, one made by city and the other by county officers. A study of these two rolls through a period of years will throw some light on the trend in wealth increase. These two assessment rolls are shown in Table XXVIII, together with figures showing the percent increase by years. For school district purposes the county roll applies and not the city roll.

It will be noticed that the city figures are consistently higher than the county figures. The reason is not so much a difference in the two estimates of total wealth but a difference in basis of assessment. The city has made its assessments on approximately a 60 to 70 percent basis and the county on a 40 to 50 percent basis. Generally speaking, the city roll represents 60 to 70 percent of what Berkeley's true wealth is estimated to be. However, in 1921 the basis of assessment for personal property is reported to be 60 percent. Some years the county roll is reported on a 50 percent and again on a 60 percent basis.¹ This doubtless accounts for some of the fluctuations in these columns.

The last two columns of the table, showing the percent of annual increase in the two rolls, suggest that at times the bases of assessment have been shifted more than the government reports indicate. While we do not expect true wealth to increase at a reg-

¹ *Financial Statistics of Cities* for 1923, Table 25, and earlier volumes were consulted.

TABLE XXVIII
CITY AND COUNTY ASSESSMENT ROLLS

Year	City Roll	County Roll	Percent Increase	
			County Roll ¹	City Roll
1924-25.....	\$73,196,075	\$48,633,375	5.0	14.0
1923-24.....	64,190,250	46,314,925	7.8	7.8
1922-23.....	59,523,740	42,960,800	2.2	6.1
1921-22.....	56,087,540	42,031,275	8.7	9.2
1920-21.....	51,345,765	38,640,225	3.6	8.4
1919-20.....	47,365,205	37,292,475	3.0	2.2
1918-19.....	46,331,795	36,202,650	1.2	2.3
1917-18.....	45,284,390	35,770,300	1.6	.9
1916-17.....	44,881,094	35,180,225	7.4	2.8
1915-16.....	43,615,640	34,919,775	1.6	2.1
1914-15.....	42,706,490	34,370,650	-1.1	5.2
1913-14.....	40,583,720	34,740,375	5.0	4.2
1912-13.....	38,917,900	33,062,200	5.7	4.8
1911-12.....	37,102,245	31,273,200	11.1	3.8
1910-11.....	35,736,140	28,150,450	-14.2	5.4
1909-10.....	33,899,444	32,834,560	14.5	7.2
1908-09.....	31,597,998	28,661,150	.7	12.9
1907-08.....	27,963,837	28,647,225	63.9	17.6
1906-07.....	23,765,499	17,470,125	10.7	44.7
1905-06.....	16,420,026	15,779,030	25.6	17.1
1904-05.....	14,012,765	12,561,335	6.5	14.5
1903-04.....	12,230,695	11,792,300	36.5	15.4
1902-03.....	10,596,028	8,633,610	4.2	10.6
1901-02.....	9,576,940	8,280,325	11.3	7.0
1900-01.....	8,948,710	7,438,925		

ular rate, yet we do not expect it to fluctuate as there rates of increase fluctuate.

BERKELEY'S WEALTH IS INCREASING. This table is presented for two purposes. It shows an enormous increase in taxable wealth in the 25 years covered, 71 percent for the city roll, and 55 percent for the county roll. In 1900 the assessed wealth per capita was \$677 by the city roll, and \$563 by the county roll. In 1910 these figures were \$833 and \$693. In 1920 the per capita city roll had risen to \$916, while the per capita county roll had fallen to \$689 or \$4 below the previous decade. This per capita increase might be due in some part to a rise in the basis of assessment, but this certainly does not account for all, or even a large part of the increase. The city unquestionably has grown wealthier.

¹ Exclusive of Unsecured Personal Property.

The second point suggested by the table, especially by the rates of increase, is that the assessed wealth has not maintained a constant rate of advance. The gain may be 63.9 percent one year and less than 1 percent the next; or it may even decline as it did in 1910 and 1914 on the county roll, and then go up again. One cannot review these figures without getting the impression that the total tax load in Berkeley has varied greatly from year to year. This means that when Berkeley wants a certain public service the people do not ask merely what will it do to our tax rate, they buy the service if they feel that it is worth the money, and let the tax rate, or the basis of assessment, which is the same thing in effect, take care of the necessary adjustment.

BERKELEY'S TAX RATES ON ASSESSED VALUES. This same impression is gained from an examination of the tax rates, as shown in Table XXIX. No one of the rates has risen with perfect regularity though the total approximates it. Even so, this rise reflects the fact that the city has decided upon its needs and then laid a tax to meet those needs. Both the total tax rate and the assessed valuation have gone up. Probably on the average the assessed valuation has no more than kept pace with true values. If so, then rise in total tax rate shows the rise in cost of public service, or rather the increase in amount and kinds of service provided through public means.

TABLE XXIX
BERKELEY TAX RATES
1915-1925

Year	CITY RATES			COUNTY RATES			Total Tax Rate
	Gov't.	School	Total	Gov't.	School	Total	
1924-25	\$1.21	\$0.39	\$1.60	\$1.67	\$1.73	\$3.40	\$5.00
1923-24	1.21	.39	1.60	1.61	1.45	3.06	4.66
1922-23	1.18	.42	1.60	1.55	1.49	3.04	4.64
1921-22	1.18	.40	1.58	1.56	1.52	3.08	4.66
1920-21	1.195	.385	1.58	1.52	1.54	3.06	4.64
1919-20	1.21	.30	1.51	1.58	1.42	3.00	4.51
1918-19	1.19	.225	1.415	1.58	1.17	2.75	4.165
1917-18	1.17	.21	1.38	1.32	.75	2.07	3.45
1916-17	1.205	.225	1.43	1.08	.60	1.68	3.11
1915-16	1.20	.13	1.33	1.02	.58	1.60	2.93
1914-15	1.105	.013	1.12	0.99	.71	1.70	2.82

The cheapened dollar is of course involved in these figures. It ought not to affect the tax rate but it probably has done so indirectly by the fact that generally over the country assessed values have not reflected the change in money values. Finally, however, high costs had to be met and this lowered value had to have expression. If valuations remain on the old basis then the change has to show in tax rate. The rate of growth in taxable wealth shown in Table XXVIII very strongly suggests that assessments were not made on the cheap dollar basis. If they had been the rates of increase in the tax rolls would almost certainly have been larger. If they had been raised then our tax rates would have been lower.

There is an extra point in these two tables. In addition to showing that wealth is growing rapidly in Berkeley, and in addition to making available the facts about assessed values and tax rates, the evidence these tables offer supports the previous suggestion that, in the matter of public service Berkeley has not had to hesitate because of cost. Berkeley is not a poor city. It has had in the past, and the above indications are that it can continue to have the kinds of public service—including education—that are in line with the ideals of the people.

BERKELEY'S TRUE WEALTH. The above figures show that Berkeley has had a rapid growth in assessed wealth. By converting these figures to true wealth they will reveal whether this is really growth in wealth, or merely growth in the bases of assessment. As to this the figures of Table XXX from federal census bureau reports leave no doubt.

TABLE XXX

TRUE WEALTH PER CAPITA IN BERKELEY AND THE AVERAGE
PER CAPITA TRUE WEALTH FOR ALL CITIES OF
BERKELEY'S CLASS

Year	Berkeley	All Cities
1923	\$1432.62	\$1571.37
1921	1349.20	1271.15
1919	1003.70	1134.62
1918	1103.39	1169.27
1917	1119.61	1144.67
1916	1103.41	1091.47
1915	1336.10	

Since 1916 there has been a substantial if not a continuous rise in per capita true wealth, and during several of the years reported Berkeley's per capita wealth has been greater than that of the average for cities of Berkeley's class. On the basis of these facts it is plain that Berkeley's financial ability is on the increase and that Berkeley must be ranked as about an average city for its class.

It is true that Sacramento, Pasadena, Stockton, Long Beach, Fresno, San Diego, and San Jose are reported in 1923 as having a higher per capita wealth, yet Oakland stood just a very few dollars higher than Berkeley.

WEALTH PER PUPIL. When we examine these cities from the standpoint of the number of children they have to train, instead of from that of total population, then Berkeley ranks somewhat higher, as appears from Figure 9. In a sense this is a fair basis of comparison, since it judges wealth by the load it carries.

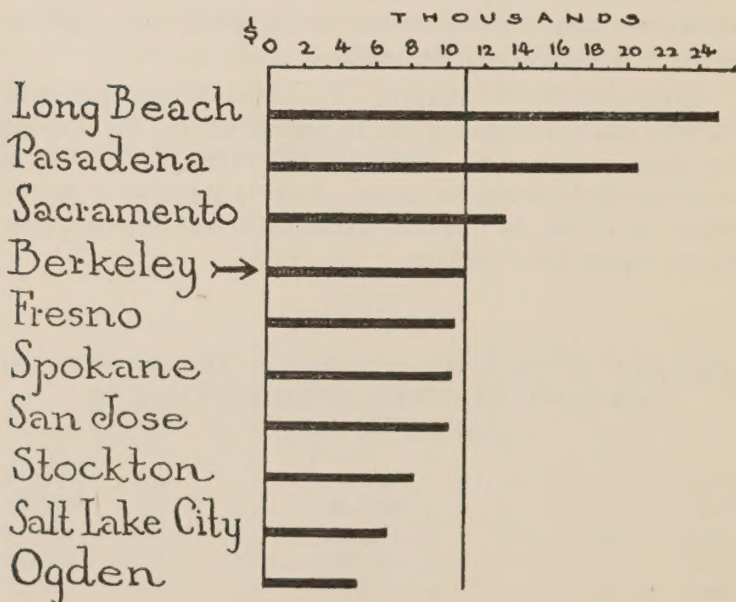


Figure 9

Amount of true wealth per pupil in average daily attendance in ten Western cities, 1924-25.

WEALTH AND EXPENDITURES. The total amount of wealth a city has is less significant than is the net wealth or what it saves for reinvestment. This latter figure is not available in exact terms, though we are able to compare cities on the basis of the cost of all their public services. The latest federal report on finances of cities (1923) shows that Berkeley's expenditures amounted to a total of \$35.03 per capita or \$24.45 per \$1000 of true wealth. Of this amount 56.5 percent went for schools.

Two tables of facts are presented here to show how Berkeley ranks with western cities of the same class and particularly with California cities. Table XXXI shows what these cities spend out of each \$1000 of wealth owned, and Table XXXII shows what they spend per capita. First is shown the total spent, exclusive of and then including interest payments. Second, what is spent for schools, first excluding and then including interest pay-

TABLE XXXI

COST FOR CITY MAINTENANCE PER \$1,000 OF TRUE WEALTH
IN THIRTEEN WESTERN CITIES, WITH COST AND
PERCENTAGE AMOUNT SPENT FOR
SCHOOLS (1923)

City—	Total Cost		Cost for Schools		% for Schools	
	Excl. interest	Incl. interest	Excl. interest	Incl. interest	Excl. interest	Incl. interest
San Jose	\$19.06	\$20.25	\$11.98	\$12.76	62.9	63.0
Ogden	21.94	27.63	12.76	13.96	58.1	50.5
BERKELEY	22.49	24.45	12.48	13.82	55.5	56.5
Pasadena	19.71	21.09	10.72	11.33	54.4	53.7
Fresno	25.63	27.62	13.87	15.29	54.1	55.4
Salt Lake City.....	18.68	21.97	9.87	10.48	52.3	47.7
Spokane	19.14	21.22	9.79	10.38	51.1	48.9
Long Beach	16.23	18.24	8.22	9.26	50.6	50.8
Sacramento	21.43	25.11	10.57	12.09	49.3	48.1
Tacoma	20.07	23.28	9.66	9.98	48.1	42.9
San Diego	23.11	27.61	10.90	11.50	47.1	41.6
Stockton	21.74	24.36	9.87	10.96	45.4	45.0
Butte	14.62	16.89	6.06	6.34	41.4	37.5
Median Western Cities	\$20.07	\$23.28	\$10.57	\$11.50	51.1	48.9
Eight Calif. Cities.....	21.58	24.40	10.73	11.79	52.3	52.2

Note how very similar the percentages in this table (on the basis of per \$1,000 of true wealth) are to the percentages given in Table XXXII (on the basis of per capita cost).

ments; and, finally, what percent of total expenditures goes for schools. At the bottom of these two tables is shown what the median city of the 13 western and of the 8 California cities spends. The cities are arranged in order of the percent of total expenditures that went for schools.

TABLE XXXII

PER CAPITA COST FOR CITY MAINTENANCE AND PER CAPITA
AND PERCENTAGE AMOUNT FOR SCHOOLS (1923)

(Thirteen Western Cities)

Note: Cities are arranged in descending order of the *percentage*
spent for schools.

City—	Total per capita cost		School per capita cost		Percentage of Total for Schools	
	Excl. interest	Incl. interest	Excl. interest	Incl. interest	Excl. interest	Incl. interest
San Jose	\$28.41	\$30.19	\$17.85	\$19.01	62.8	62.9
Ogden	24.07	30.31	14.00	15.29	58.2	50.4
BERKELEY	32.22	35.03	17.87	19.80	55.5	56.5
Pasadena	46.38	49.63	25.23	26.68	54.4	53.8
Fresno	39.03	42.06	21.12	23.29	54.1	55.4
Salt Lake	27.14	31.93	14.33	15.19	52.8	47.6
Spokane.....	30.58	33.90	15.63	16.51	51.1	48.7
Long Beach	36.23	40.72	18.34	20.66	50.6	50.7
Sacramento	38.78	45.44	19.14	21.90	49.4	48.2
Tacoma	25.69	29.80	12.37	12.67	48.1	42.5
San Diego	34.15	40.81	16.11	17.00	47.2	41.6
Stockton	35.25	39.50	16.00	17.78	45.4	45.0
Butte	22.05	25.48	9.14	9.51	41.5	37.3
Median	\$32.22	\$35.03	\$16.11	\$17.78	51.1	48.7
Eight Calif. Cities.....	35.74	40.76	18.10	20.23	52.3	52.2

There are several points of interest in these two tables. In total expenditures per \$1000 of true wealth Berkeley stands a little above the median of the 13 western cities, but only barely above that for the 8 California cities. In per capita total expenditures, however, Berkeley's load exactly equals that of the median western city, and is well below that for California cities. When it comes to schools, it appears that more than an average part of Berkeley's public moneys go for this purpose. Both in amount spent per \$1000 of true wealth and in amount spent per capita Berkeley takes a high rank among the 13 western cities and a

relatively high rank among the 8 California cities. This is made clear by the last two columns of these two tables.

In total expenditures (all public expenditures) per \$1000 of true wealth, Berkeley ranks third among the 8 California cities and third among the 13 western cities. In percent of total expenditures per \$1000 of true wealth that goes for schools, Berkeley ranks second among the 8 California cities and third among the 13 western cities. This speaks very well for Berkeley.

When total expenditures are expressed on a per capita basis, then Berkeley ranks seventh among California cities, and seventh among the 13 western cities. On school expenditures, however, Berkeley holds fifth place in both comparisons. That is, Berkeley spends more on government and more on schools in proportion to wealth, but not in proportion to population, than do the average of California or western cities. Berkeley spends far less per capita for all purposes and also less per capita for schools than do California cities of Berkeley's class. Relative to its wealth, then, we may say that Berkeley has not had costly government nor costly schools.

BERKELEY'S TOTAL TAX BURDEN. In Table XXIX Berkeley's tax rates on assessed wealth were shown through a period of years. Here, with Figures 9 and 10, facts will be presented to show what kind of financial burden the tax rate represents. Government costs are paid largely but not solely from taxes. This applies especially to schools. Berkeley receives a large sum for schools each year from the state. This state money is raised by a tax on operative property, practically all of which belongs to corporations. The more Berkeley spends of this kind of money, and of money earned by various departments of the city government, the less it has to raise by the property tax. Hence the tax rate figures do not correspond to the figures on government and school costs. That is, the figures shown in Figures 9 and 10 will not be likely to correspond to the figures in Tables XXXI and XXXII.

In Figure 10 is shown the per capita total tax levy in 13 western cities for the year 1923. A glance at this chart shows that Berkeley is carrying a relatively light tax burden in 1923, holding third from lowest place in the group.

In Figure 11 is shown the same type of tax information, though here the rates are expressed in amount per \$1000 of true wealth.

On this basis, Berkeley holds substantially better than an average position in 1923, though not so favorable a place as on the per capita basis. In 1925 of the 8 cities for which data were obtainable Berkeley holds next to the lowest position. Thus Berkeley's tax burden is not only excellent, that is, light, in comparison with other cities, but is showing improvement.

HOW BERKELEY'S PUBLIC MONEY IS SPENT. There is yet one other question about government costs before leaving the question of measuring Berkeley's financial burden and that is the question of how Berkeley's tax money is spent. Even though a city may have a relatively light tax burden it wants to have its tax money wisely spent.

It was noted above in Table XXXI that in comparison with western cities a larger than average share of Berkeley's public expenditures goes for schools. This is a compliment to Berkeley, for it means that Berkeley has its city government at a relatively lower cost or, in other words, that a relatively large part of its public money goes for constructive purposes. It may be added here that the 1923 federal report of finances of cities showed that for all cities of Berkeley's class combined but 45.5 percent of total expenditures went for schools, while for Berkeley this figure (exclusive of interest) was 55.5 percent.

HOW BERKELEY'S SCHOOL MONEY IS SPENT. As to school moneys, Berkeley's record through a period of 13 years is worthy of study. Through the period 1912 to 1925, inclusive, from 2.14 to 4.43 percent of all school expenses went for general control, the highest figure being for the year 1919-20 and the lowest for 1917-18. The average for the 13 years has been 3.22 percent. During 1924-25 this cost was but 2.80 percent, or well below the 13-year average.

Table XXXIII gives a good picture of a complete percentage analysis of school expenditures through these years by showing for each year the highest, the lowest, the median, and the two quartile percentages for each of the 7 items of current expenditures. Outlay costs are not included.

It is a commendable fact that Berkeley has devoted so large a percentage of total school expenditures to teachers' salaries and other direct instructional costs. Never below 74.91 percent of the total spent, in 1914-15 it amounted to 80.75 percent. There

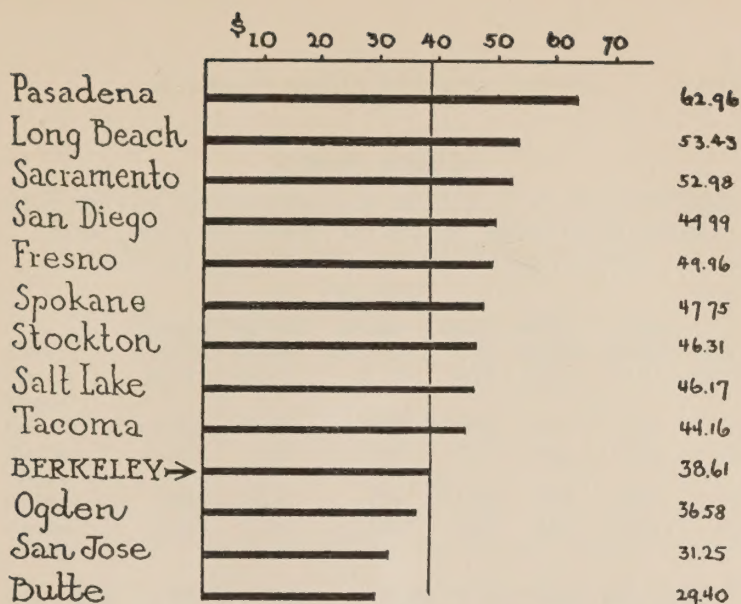


Figure 10

Per capita total tax levy in thirteen Western cities, 1923.
(From *Financial Statistics of Cities*.)

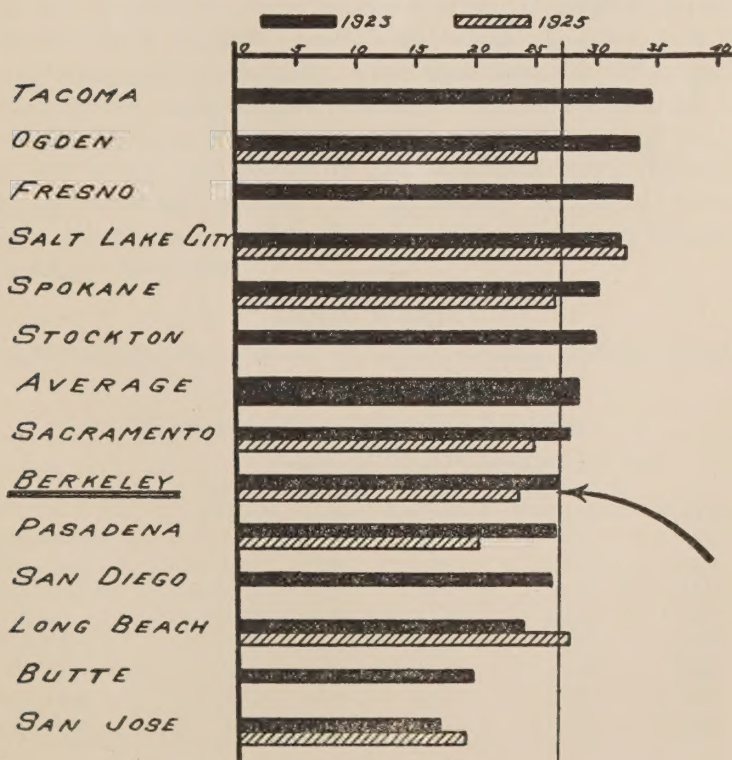


Figure 11

Total tax levy per \$1000 of true wealth for thirteen Western cities.

TABLE XXXIII

PERCENTAGE DISTRIBUTION OF BERKELEY SCHOOL EXPENDITURES, 1912-13 TO 1924-25, INCLUSIVE, SHOWING HIGHEST, LOWEST, MEDIAN AND TWO QUARTILE FIGURES

Case—	Other Exp.						
	General Control	Teachers' Salaries	of Instr. and Library	Operation	Maintenance	Fixed Charges	Aux.
Highest	\$4.43	\$80.75	\$7.20	\$9.94	\$7.63	\$1.19	\$2.16
Upper Quartile	3.95	78.75	5.29	8.42	4.33	1.10	1.71
Median	3.48	77.61	5.01	8.17	3.52	0.64	1.16
Lower Quartile	2.30	76.63	4.81	7.56	2.85	0.26	.64
Lowest	2.14	74.91	3.96	7.15	1.92	0.01	.01

are certain to be fluctuations in some of the items and these of course affect the item of instruction.

In order that Berkeley's position may be compared with those of other California cities in the matter of how it spends its school money, Table XXXIV, covering the school expenditures of 8 California cities, is presented. From these figures it will be seen that but two cities surpass Berkeley in the percent devoted to teachers' salaries, and but one in other direct instructional costs. It will be seen also, that in the item of general control Berkeley is one of the middle cities. Putting teachers' salaries and other instructional costs together, Berkeley holds the highest position of any of these cities.

TABLE XXXIV

PERCENTAGE ANALYSIS OF CURRENT SCHOOL EXPENDITURES
IN 8 CALIFORNIA CITIES 1924-25

(Figures from office of State School Department)

City—	Percent of Total Maintenance Cost for				
	General Control	Teachers' Salaries	Other Instruction	Operation & Maintenance	All Other
Sacramento	2.54	81.02	2.42	9.57	4.45
San Jose	2.31	79.94	1.79	11.55	4.41
BERKELEY	2.69	78.39	5.89	10.45	2.58
Fresno	4.14	76.78	4.52	10.61	3.95
Long Beach	3.89	75.23	3.38	13.16	4.34
Stockton	2.31	75.12	7.57	11.92	3.08
San Diego	2.37	75.02	4.21	13.54	4.86
Pasadena	7.05	62.70	5.69	17.46	7.60

SIGNIFICANCE OF ABOVE FACTS. To sum up the evidence so far presented in this chapter we may say that all the population studies reported in Chapter II indicate that Berkeley is a prosperous growing city. Measures of its taxable and true wealth show that wealth is increasing even more rapidly than population, so that Berkeley may in time hope to hold better than its present average standing among cities of its own class. In comparison to its educational load Berkeley stands only slightly below the average for western cities of its class.

Of the cost of public service Berkeley devotes much more than an average part to the maintenance of schools. In total tax burden Berkeley holds much better than an average position among western cities of its class when judged by per capita wealth, and about average when judged by true tax rate. Finally, it was shown that Berkeley spends its school money with good effect, keeping its overhead relatively low and its instruction costs relatively high in proportion to total costs.

All this shows Berkeley to possess better than average financial ability at the present time and to be in a healthy and growing position financially. There is no reason suggested by the facts here presented why Berkeley should not have somewhat better than an average system of schools.

4. BERKELEY'S TOTAL NET INDEBTEDNESS

THE TREND IN BERKELEY'S DEBTS. The amount of debt a city carries has much to do with that city's ability to finance new projects. Berkeley's past position in the matter of total net debt is clearly shown in Table XXXV, which gives through a period of

TABLE XXXV

PER CAPITA TOTAL NET DEBT FOR BERKELEY AND FOR ALL CITIES OF BERKELEY'S CLASS, 1910-1924

Year	Berkeley	Average City
1924	\$52.13	No data
1923	52.29	\$66.25
1922	59.52	59.76
1921	55.61	52.44
1917	28.20	48.52
1916	30.87	46.90
1915	33.64	44.43
1912	29.54	46.60
1911	21.23	36.53
1910	23.64	34.10

years the per capita net debt for Berkeley, and the per capita combined net debt for all cities of Berkeley's class in the United States.

This table shows that Berkeley's debt per person has increased to be sure, but it shows that Berkeley has, with the exception of 1921, had less debt than the average city of its class. It shows a rapid rise in recent post-war years, but not as rapid as is shown for the average city.

This is made clearer when these figures are shown graphically as in Figure 12. The black bars stand well below the others with

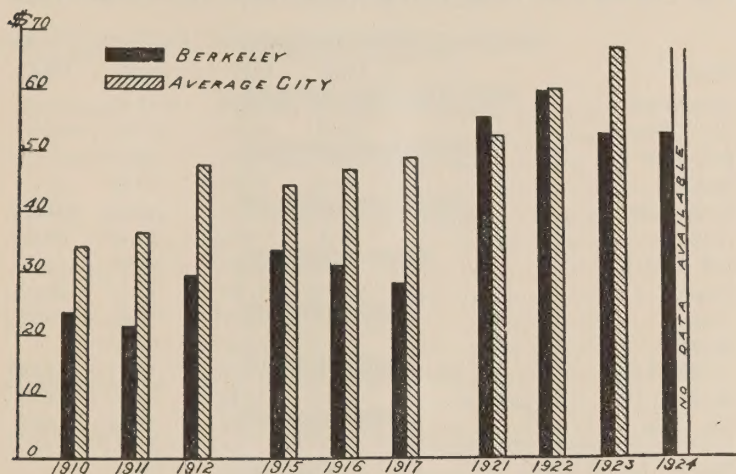


Figure 12

Per capita total net debt for Berkeley and for all cities of Berkeley's class, 1910-1924.

the exception of the one year noted. Not all of the rise in height is due to actual increase in economic burden. Most of it is due to decline in the value of the dollar.

In considering this rise in per capita debt we must remember one very important point. The dollar of today is worth only about half what it was worth before the war. A very considerable part of this recent rise is fictitious therefore, and not real increase in economic burden. It is clear, then, that Berkeley is and has been for many years in a favorable position in the matter of indebtedness.

BERKELEY'S POSITION AMONG WESTERN CITIES. While Berkeley holds a favorable position in comparison with all cities of its class, it is well to judge Berkeley in comparison with western cities, where the problems have been more alike, and where the cities are more nearly the same age. For this purpose Table XXXVI is presented here showing the per capita net debt of 13 western cities, for the years 1922 to 1925, inclusive.

TABLE XXXVI

PER CAPITA NET DEBT IN THIRTEEN WESTERN CITIES (1923)

City—	Per Capita Net Debt ¹		Per Capita Net Debt	
	1924 ³	1923	1922	1925 ³
Sacramento	\$156.89	\$158.70	\$141.83	.....
San Diego.....	138.90	143.40	143.80	\$138.90
Pasadena ²	158.67	96.65	67.10	.....
Ogden	90.92	87.26	85.24	.....
Long Beach	126.93	82.73	81.51	147.31
Stockton	83.87	78.30	84.69	89.80
Salt Lake City.....	74.09	76.36	79.03	.....
Tacoma	102.80	67.89	71.42	103.10
Fresno	54.15	56.49	58.86	50.50
Spokane	51.76	55.56	60.42	.....
BERKELEY	52.13	52.29	59.52	42.29 ⁴
Butte	41.38	42.28	43.50	39.89
San Jose.....	63.66	35.65	38.19	58.97
Median for 13 cities.....		\$76.36	\$71.42	
Median for 8 California cities.....		80.51	74.30	

An examination of this table shows that Berkeley holds an even more favorable position when compared with western cities than when compared with all cities of this population group. The data for 1925 are incomplete, but as far as they go they show Berkeley with next to the lightest debt burden. Berkeley's excellent position is made clearer when these figures are presented graphically as in Figure 13, which shows the relative position of each city for the years 1922 and 1924.

¹ Net debt—funded and floating debt less sinking fund assets.

² On June 30, 1925, Pasadena's per capita net debt was \$173.13.

³ Data not yet published for 1924 and 1925. The figures here shown for these years were obtained from the United States Census Bureau.

⁴ Computed.

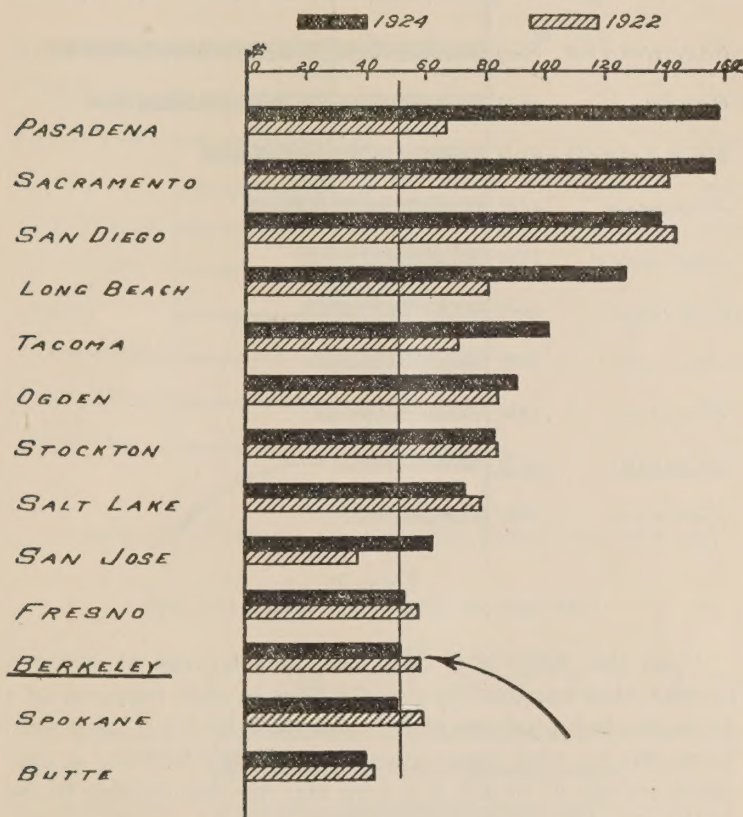


Figure 13

Per capita net debt in thirteen Western cities, 1922 and 1924.

DEBT AS COMPARED TO TRUE WEALTH. While Berkeley holds an excellent position when compared on a per capita basis it remains to be seen whether this position is retained when comparison is made on the basis of wealth. To answer this question Figure 14, showing the amount of total debt per \$1000 of true wealth in 1924-1925 is presented. Here Berkeley's position is shown in comparison with those of eight other western cities for which the data were obtainable.

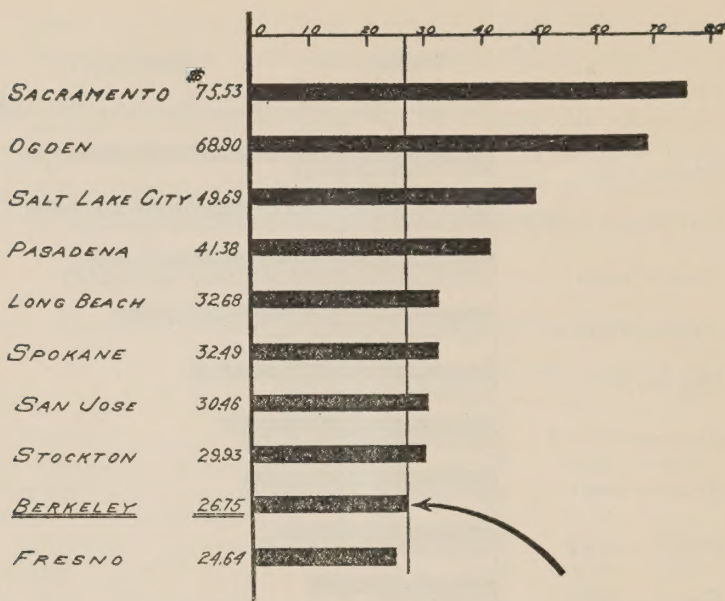


Figure 14
Total debt per \$1000 of true wealth, 1924-1925.

From this figure it is clear that Berkeley has as strong a position when measured on a wealth basis as when measured on a per capita basis, but one of the eight cities having a lower debt. From this we must assume that, even though Berkeley is only about average in wealth it is very near the top position in the matter of being free from public debt.

5. BERKELEY'S SCHOOL DEBT

SCHOOL DEBT AND TRUE WORTH. When we turn to an examination of school debts we find that in relation to true wealth Berkeley's position is about average for western cities of its class. This is made clear by Figure 15, which shows the school debt per \$1000 of true wealth for ten western cities for which 1924-25 data were obtainable. Here Berkeley's position is near the middle of the group. It is in fact just below the average of the group.

A second important view of Berkeley's school debt status is seen from Figure 16, which shows what percent of the present total value of the school plant is covered by debt according to 1925 figures. Here it is shown that Sacramento's school debt is

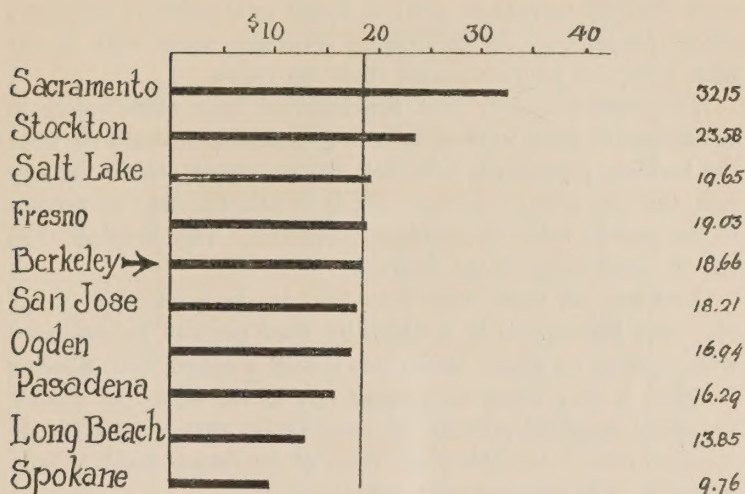


Figure 15

School debt per \$1000 of true wealth in ten Western cities, 1924-1925.

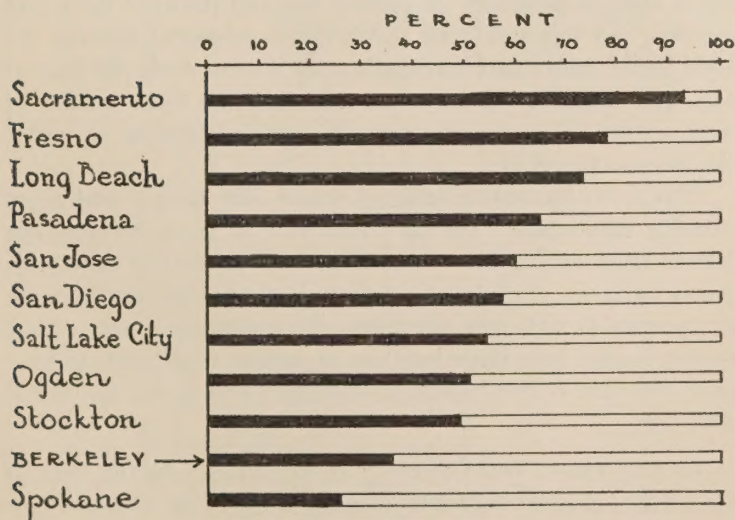


Figure 16

Ratio of school debt to total value of school property in eleven Western cities, 1925

more than 90 percent as great as is the total value of the city's school properties. In this matter Berkeley holds next to the most favorable position among these ten cities.

This makes it clear that Berkeley has been conservative in the matter of going in debt for schools, possibly wrongly so, since the building program is now well behind actual needs. At any rate, the city owns 74 percent and is in debt for only 36 percent of the present value of its school properties. This is better than any of these cities except Spokane.

Together, all these debt facts tend to show the same thing, *viz.*, that Berkeley is in a distinctly good position as compared with cities of its class. When this is said it means that, whereas Berkeley is only about an average city in the matter of wealth, its actual financial position is much better than this when we consider that it has relatively little of its future taxes already expended in the form of debt obligations.

RECORD OF SCHOOL BONDS OUTSTANDING. In working out a plan for financing the building program to be proposed it seems wise not only to make available to the people of Berkeley the present financial status of the city, but especially to make available a clear statement of the present financial status of the school district. To this end Table XXXVII is presented showing the bond issues still in part outstanding, the date of each, the interest rate, the term and date of final maturity, the total amount of interest that will have been paid when fully liquidated, and what the issue was used for.

This is an interesting table of school debt history and offers valuable suggestions. During a period of 34 years Berkeley has had to issue only a little more than four millions of bonds for school building. This has been done in eleven separate issues, or at the rate of \$121,794 per year. This average is not a large annual burden from the standpoint of present wealth yet, to have paid that sum in 1900 would have added \$1.36 to the tax rate of that day.

INTERMITTENT AND CONTINUOUS BUILDING. As the data of these issues suggest, the school building needs of the city have not come at regular intervals, so that the burden would be evenly spread through the years. When a city is small it needs a new building only once in ten or fifteen years; when it gets larger,

TABLE XXXVII

RECORD OF BERKELEY'S UNPAID SCHOOL BOND ISSUES

Date of Issue	Amount of Issue	Rate of Interest	Method of Liquidation	Term	Date of Final Payment	Total Interest Cost when Issue is Retired	For What the Money Was Expended
1892	\$50,000.00	5%	.....	20 yrs.	1912	No record prior to 1900	Columbus, Whittier, LeConte.
1900	100,000.00	4½%	Serial	40 yrs.	July 10, 1940	\$90,135.36	Old Hillside, Berkeley High School (now Part Time). Issued by City of Berkeley.
1905	150,000.00	4½%	Serial	42 6/7	July 15, 1949	149,581.25	Land for Jefferson and Whittier. Building for Washington. Additions to LeConte, Columbus, Lincoln, Franklin and Whittier.
1906	200,000.00	4½%	.....	20 yrs.	July 15, 1927	89,629.75	Auditorium and Science Building, High School.
1906	20,000.00	4½%	.....	20 yrs.	July 15, 1927	9,045.00	Repairs to High School Building (Part Time).
1906	100,000.00	4½%	Serial	40 yrs.	July 15, 1946	91,878.25	Land and building for Jefferson. Property for Hillside, Washington, Emerson, Columbus and Hawthorne. Property and addition to Longfellow. Improvement to grounds, heating plants and plumbing.
1908	50,000.00	4½%	.....	40 yrs.	July 15, 1948	47,158.93	To complete Auditorium and Science Building.
1908	200,000.00	4½%	Serial	40 yrs.	July 15, 1948	187,025.00	Additions to Longfellow, Lincoln, Oxford. Improvements to grounds at Washington, Emerson, McKinley and Franklin. Land and building at Hawthorne and LeConte. Land for Jefferson and Washington. Manual Training Building at Washington. Addition to Emerson and Columbus. Manual Training, Domestic Science equipment. Manual Training Building at Whittier, LeConte and Franklin. Altering heating system at LeConte, Columbus, Whittier and Lincoln.
1915	500,000.00	5%	Serial	40 yrs.	1955	513,596.25	John Muir, Burbank, Edison, Willard, University Elementary.
1919	892,000.00	5%	.....	40 yrs.	1959	840,825.00	Academic Building, Gymnasium, Science Building, Boiler Plant, Part Time.
1919	1,429,000.00	5%	Serial	40 yrs.	1959	1,402,125.00	Columbus, Emerson, Franklin, Hawthorne, Hillside, Jefferson, John Muir, LeConte, Lincoln, Longfellow, McKinley, Oxford, Thousand Oaks, University Elementary, Washington, Whittier.

however, the call for additions comes more frequently. A small city cannot easily handle its building program on a cash basis. A very large city can do so if it can once get free from debt and get caught up with building. Berkeley's present position and future possibilities for working on a cash basis will concern us in the final chapter of this report. Here it may be seen that Berkeley could not easily have raised \$100,000 in the year 1900, nor \$250,000 in 1908, nor \$2,321,000 in 1919 by a direct tax. The burden would have become unreasonably heavy and the people would not have approved it. At present the unpaid school debt stands at over two and a quarter millions of dollars and there is an urgent need for a heavy outlay for new construction. The specific way in which this new burden should be assumed will concern us later. Here we should note that Berkeley has so far not entered upon a continuous program of construction, as the dates of the present buildings show. Obviously the city has not needed it in the early years, though in recent years it has needed much more than has been done, as was noted in the last chapter, and as time goes on this need will become gradually more and more continuous as the city grows. This means that once Berkeley catches up with building needs it will be necessary to keep a building program going continuously every year.

BERKELEY'S METHOD OF BONDING. There is one thing about Table XXXVII that ought to be studied by Berkeley taxpayers, and that is the length of term, the interest cost, and the final column showing what the money was used for. The forty-year term has been wrong without question. So far as land purchases are concerned there is no objection to long term loans. But it may be seen here that some of the buildings that are now ready for the discard are not yet paid for and will not be until several years after they will have been abandoned. Future generations will have problems enough without an inheritance of public debts that were incurred for things the present generation has consumed. This is not only a plain matter of being just to our children and to future Berkeley but, a review of the interest column in this table shows that the city is paying nearly twice the cost of its buildings. As a problem in economy this is surely a matter that needs no argument. The 1919 issue should never have been put on a forty-year basis.

RECORD OF PAYMENTS MADE AND TO BE MADE ON EACH OF BERKELEY'S PRESENT UNPAID BOND ISSUES

Total	\$100,000.00	\$90,135.36	\$150,500.00	\$149,905.00	\$100,000.00	\$9,878.75	\$200,000.00	\$89,629.75	\$20,000.00	\$9,045.00	\$200,000.00	\$187,024.75	\$51,250.00	\$47,158.93	\$500,000.00	\$543,596.25	\$1,429,000.00	\$1,401,275.00	\$897,000.00	\$840,825.00	\$7,068,223.79
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There is one feature of this debt story, however, that is highly commendable. All of Berkeley's school bonds are serial bonds. Payments on the principal were begun at once and kept up year after year. This is accepted everywhere as sound policy. Berkeley's error is therefore a very minor one in comparison to what it would have been had all these payments on principal been left to the end of the term or devoted to sinking funds as many cities have done in the past. There are arguments to the contrary that the writer would accept for private debts where the purpose of the loan is to earn profits but not for public debts where the purpose is public service.

In order to show the methods Berkeley has used in issuing school bonds since 1900 Table XXXVIII is presented showing for each issue the record of all past interest and principal payments and what these payments will be until the bonds are fully liquidated.

For instance, the issue of 1900 appears in the first two columns. This issue was for \$100,000. The issue was not sold at once. Payments began in 1902 and will be completed in 1941. When completed the \$100,000 will have been repaid and with it \$90,135.36 in interest. Each of the issues may be read in the same way. Two of the 1906 issues will be paid up next year, but one will run to 1947. The 1905 and 1908 issues expire in 1949, the 1915 issue in 1955, and the 1919 issues in 1959.

In order to bring these debt facts into a single picture that will indicate the extent of the burden they represent and the time through which this burden will have to be carried, the totals of annual payments on principal and interest are shown graphically in Figure 17. It will be seen that the peak of the curve was reached in 1923 and that from now on the descent will be quite rapid. The only objection to this picture is that it reaches too far into the future. If the reader will turn to Table XXV, showing the estimated dates upon which abandonment of the buildings covered by these issues fall it will be made clear that these curves reach too far into the future. However, as tax burden they are relatively of little consequence in the latter years, and especially so when we consider that the curve of financial ability (wealth or social income) is rising rapidly and that there is excellent prospect for a continued rise.

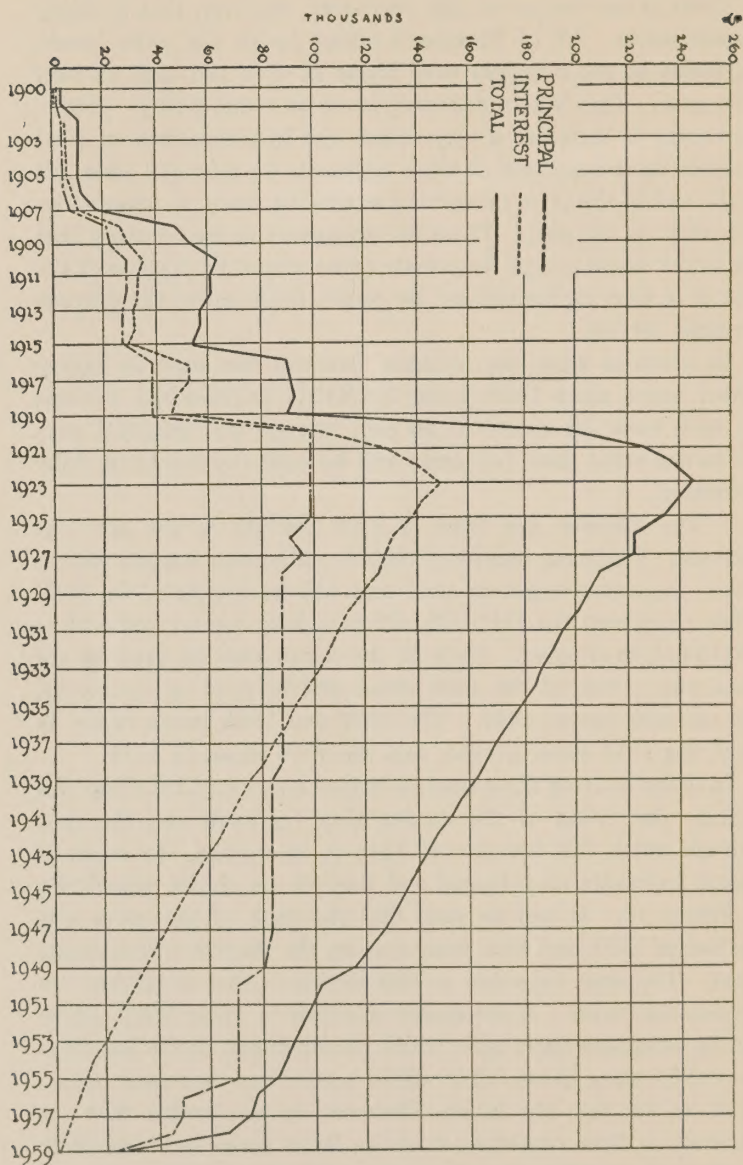


Figure 17

Principal and interest payments on Berkeley's permanent school indebtedness.

CONCLUSIONS AS TO BERKELEY'S FINANCIAL ABILITY. In the light of all the facts set forth here about Berkeley's growth in population and wealth, about its present signs of business and industrial growth, about its relatively low tax burden, about its wise distribution and use of its public funds, about its sound position in the matter of debts, it may be said without fear of being controverted by any who will honestly weigh the evidence, that Berkeley is amply able to have a good or even an excellent school system, and that it is entirely reasonable that Berkeley should at once proceed with the development of its school plant until it is brought up to the position where annual additions will keep the plant in first-class condition.

PART II

THE BUILDING AND FINANCIAL PROBLEM

CHAPTER VI

THE PROPOSED BUILDING PROGRAM

I. THE PROBLEM

In Part I of this report is presented a review of the present conditions and needs of the schools of Berkeley as these relate to the school plant and to the general housing situation, together with a consideration of the financial capacity of the city to meet its needs. In Part II it will be the purpose of the report to prescribe a solution of the building problem as it exists at present, to project the program for some years into the future, and to suggest a plan by means of which the cost of construction may be met.

It is believed that the facts set forth in Part I of this report fully warrant the following statements about Berkeley's schools.

1. Berkeley has an excellent school system in the following respects:
 - a. The whole system is clearly built around a modern conception of education.
 - b. The organization of the schools into kindergarten, elementary, junior high, and senior high groups is in line with the best thought on school organization.
 - c. The curriculum is distinctly modern in its content and in its arrangement.
 - d. The administrative organization of the system is complete and thoroughly modern.
 - e. Indications of actually superior work in classroom instruction are numerous.
2. Berkeley's school system is distinctly below what it should be, and, below what the city is able to have in the following respects:
 - a. All the high school buildings are badly overcrowded, and in three of the junior high schools there is a serious shortage of playgrounds.
 - b. Several of the elementary schools are overcrowded and at least 5 of the 17 are without sufficient play space.

- c. The schools have carried temporary housing to extremes. This, with poor housing and overcrowded rooms is seriously affecting the quality of instruction and, in some instances, offers a real menace to the health of the children.
 - d. Many of the buildings are poor in toilets, drinking and washing facilities, janitors' service rooms, and all kinds of special rooms.
 - e. One of the most serious weaknesses is in the fact that the city has nearly twice the number of elementary schools it should have. This contrasts sharply with the excellence of arrangements for the high school groups.
3. Berkeley is financially able to reduce these weaknesses to a minimum and to bring the school plant to a high degree of excellence:
- a. By gradually reducing the number of elementary schools as the replacement of outworn buildings makes this possible.
 - b. By doing away with temporary housing as anything but a very minor and very temporary feature of the school plant.
 - c. By immediately entering upon a plan of construction that will bring the plant up even with reasonable needs.
 - d. By adopting the policy of carrying on a continuous, in place of an intermittent, program of construction.

It will be the purpose here to outline a program that has been thought of in the light of these facts. It is based upon the full conviction:

1. That small schools cannot be as efficient as large schools and, further, that small schools cost much more money than do large ones.
2. That to repeat the mistakes of the past by rebuilding all these small schools is to set up a means of continuing Berkeley in the small town class where the idea of neighborhood antagonisms instead of the idea of city unity dominates alike all social, political, and educational interests.
3. That by putting aside small differences in favor of a single large, forward looking purpose in education, Berkeley can in five years have an excellent school plant, whereas, delay

for that length of time will mean that the wedge of school room shortage will be driven so deeply into Berkeley's schools that they will not recover a position better than that of mediocrity within two generations.

4. That, because of too long a delay, Berkeley is now not able to finance this program without a bond issue.

It is further based upon the principle that school buildings must be designed with strict regard for educational aims, objectives, and programs. Accordingly, the problem has been to outline a building program that fully recognizes the recommendation made in this report that Berkeley shall continue its present general educational policy; its present curriculum, which has every appearance of being kept alive and abreast of the times; and its present staff organization. The program offered has been worked out on the assumption that future construction will be carefully checked up with reference to the educational requirements that these policies, curricula, and organization require.

2. SCHOOL PLANT STANDARDS RECOMMENDED

A. *Elementary Schools*

It is recommended that future elementary school construction be worked out with regard to the following principles and standards:

1. The standard size for elementary schools shall be from 800 to 1200 pupils.
2. New buildings shall be located in such manner as will redistrict the city in a way that will aid in bringing elementary schools up to this standard size.
3. The standard size for high schools shall be:
 - a. Junior high schools, 1200 to 1600 pupils.
 - b. Senior high schools, 3000 to 3500 pupils.
 - c. Six-year high schools, 2400 to 3000 pupils.
4. The size of all elementary and junior high school playgrounds shall be established with reference to the principles embodied in the standards applied in this survey and set forth in Appendix A, remembering that this refers to absolutely minimum standards.
5. The standard elementary school class shall consist of 40 pupils; junior high school class, 35 pupils; and senior high school class, 30 pupils (for regular classrooms, all schools).

6. Standard floor area (with 12-foot ceiling) shall be 15 to 18 square feet per pupil.
7. The standard type of elementary school building for 1000 pupils shall consist of:

- 24 classrooms for regular class work, one to be larger size for choral work; rooms for special groups as per needs anticipated (ungraded).

- 1 Kindergarten suite carefully adjusted to primary rooms and providing for class or group work and for large group activities.

- 1 Auditorium to seat 600 to 1000 pupils.

- 1 Library somewhat larger than a regular class-room and opening into an upper grade room.

- 1 Special room for sewing, drawing and construction work.

- 1 Laboratory-kitchen and lunch room, size based on study of probable needs.

- 1 Health and clinic suite.

- 1 Administrative suite; space about 22 x 30, including principal's office, reception room, store room, toilet, secretary's space.

- 1 Textbook storage and supply room.

- 1 Janitor's work room.

- 1 Teachers' rest room with toilet and coat closet combined, with parent teachers' association club room and kitchenette, space of standard classroom.

Toilets to accommodate number of pupils, number based upon census studies of use of toilets in Berkeley schools.

- 2 Separate toilets for kindergarten-primary unit.

- 2 Bicycle storage spaces, boys and girls separate. The question of sheltered play space is an open question in the Berkeley climate. It is doubtless useful, though whether it is not rather expensive, considering the service, is a fair question, when the school has an auditorium and the special rooms noted above and has a carefully planned program.

B. *Junior High Schools*

The junior high school is a relatively new institution. Its real contribution lies in the intimacy with which its program is adjusted to the needs of preadolescent children. It is an attempt to break away from the formal book-classroom and memory type of instruction in favor of a broad physical and social as well as intellectual program looking toward the development of leadership and of intelligent followship as well as bare knowledge. It thinks of the child as a person of action, a person with social responsibility, and not as one who merely sits and reads and listens. The measure of success in this type of school is what children can do, how they bear responsibility, how they co-operate and compete, how they judge and understand.

The home of such a school cannot be the formal classroom of old. It must be a cosmopolitan institution providing suitable quarters for a wide variety of activities. To reduce such a plant to a fixed type would be to deaden the hopes of this new departure in school organization. The junior high school building must not yet become fixed in its form. The broad and varied objectives of training here forbid it. No two communities will work out their programs in the same way, nor should they. What we want to save is the peculiarly personal character of this plant. There are very many ways of attaining the proper junior high school objectives.

With this in mind this survey does not offer here a set of norms as can be done for an elementary school. It is possible, however, to indicate the character of a good junior high school building, and to this end the following suggestions are offered:

1. The building is individualistic and designed with reference to the particular subjects and activities it is to house. It is in a special sense built around a plan of instruction.
2. The administration of such a school is much more complicated than is true of an elementary school, and so requires more extensive facilities.¹ See Appendix B for an illustration and description of what may be regarded as a good administrative suite for a junior high school.

¹The administrative quarters at the Willard are as far as possible from ideal.

3. Classrooms will be designed for special service to suit the plan of instruction. One school may emphasize English, another mathematics, another social science. Only by knowing the needs of the community, can one set down the types of classrooms needed.
4. The health and physical education problem is of great importance. Playrooms, dressing rooms, showers, lockers, supply closets, girls' rest room, women teachers' rest room, the cafeteria, ample playgrounds (see Appendix A) and play equipment, are features of greater importance in a junior high school than they are in any other type of school.
5. The social program is only second to that of health. The little theatre, the music rooms for chorus, band, orchestra, instrumental practice, the club room for parent-teachers' association, the pupils' club room, the assembly hall, all these are essential features if the broad social purposes of the school are to be realized.
6. Training for occupational responsibility has a beginning in this school. Shops, laboratories, studios, and facilities for training in business must be so designed as to offer the broadest opportunities for exploration among the facts and experiences that underlie the whole economic structure of society. These cannot be mere rooms. They must have character, and stand as an interpretation of a given community's needs. The size, the shape, the number, the equipment, these are all special problems, and these rooms must not be reduced to type. To do so is to produce some other type of school and not a junior high school.
7. Home making, too, must be a feature of a junior high school. Some intimate knowledge and much opportunity for exploration is the goal. This means special designing of rooms and equipment in the light of the program.
8. Finally, while all school buildings should be so designed as to make interior alterations easy and inexpensive this applies with special emphasis to the junior high school.¹

The excuse for offering these general comments in place of

¹Berkeley's junior high school buildings now offer the best illustration possible of just how important this is. Note, for instance, the Edison auditorium, or the Willard offices.

specific standards is not merely because the writer does not believe that the junior high school should be reduced to type while the idea is so young and our experience with it so meager, but also because the junior high school as a new educational conception is so little understood by the general public, and so frequently assumed to be merely an advanced elementary school. It is in fact either vastly different from an elementary school or it is nothing but foolish expense. It is the best we have yet done to give educational expression to modern American civilization. Berkeley is the city in America that conceived and initiated the idea. In Berkeley the country should expect to find the finest expression of this conception.

3. THE PROPOSED PROGRAM OF REORGANIZATION

PROPOSED REORGANIZATION OF ELEMENTARY DISTRICTS. In order to initiate the movement to bring about the establishment of larger elementary schools it is recommended that in the present building program the following changes in this direction shall be effected or anticipated:

1. One new elementary school, located on the block bounded by Bancroft, Channing, Bonar, and Browning streets, to replace the present Hawthorne, Columbus, and about one-third of the Washington schools, and
2. One new school located in the block bounded by Carlton, Parker, Fulton and Ellsworth streets, to replace the present Le Conte and McKinley schools.
3. Add to the present Whittier school about one-third of the Washington.
4. Other minor readjustments which slightly enlarge the Lincoln, Longfellow, John Muir, and Jefferson schools.
5. It is the opinion of the survey commission that the University-Elementary School is not adequately justified on either educational or economic grounds, and that it is in some measure a liability to the city in both these respects. Its main justification is its service to the University. It is recommended accordingly, that this building be regarded as a temporary and not as a permanent unit of the school system, and that within a few years, as readjustments permit, it be abandoned and its pupils assigned to Hillside, Whittier, and Oxford schools.

6. It is the opinion of the survey commission that the Oxford school is almost equally superfluous on grounds of both education and economy. It is recommended, therefore, that this be not regarded as a permanent elementary school site, but that, as developments may require, it shall be turned to use as a junior high school site and its pupils assigned to Thousand Oaks, Cragmont and Hillside.

Except for items 5 and 6 these features of reorganization are made clear by Figure 18. This map is intended to show the boundaries of the various attendance districts after the reorganization has been effected. It is assumed that the principle of "choice of districts" now in operation can be applied with good effect at many points in the new arrangement.

ADVANTAGES OF THIS PLAN. This map needs to be studied with the following facts in mind:

1. The present Columbus and Hawthorne buildings are unsatisfactory and should be abandoned. The Le Conte and McKinley schools should be abandoned within a very few years. So immediate action in the direction of reorganization is possible.
2. While this appears on the map as an irregular arrangement of districts yet reference to Figure 4, showing the traffic lanes and the zoning system of the city, makes clear that even if we were free to begin anew there is no possibility of having a regular arrangement of school districts in Berkeley.

In addition to the natural barriers to such regular arrangement in the location of schools, we begin now with certain points fixed. The Longfellow, the Lincoln, the Jefferson, the Thousand Oaks, the John Muir, all are permanent plants and we are forced to recognize these locations as they are. After all, these are not badly located when we consider the directions of the population shift that is going on in West and South Berkeley. Because of such shifts in business and industry, which result in population shifts, almost no school site will remain ideal for an indefinite time.

It is believed that the two new sites suggested here have a fair prospect of being good school sites for at least the life of a substantial building.

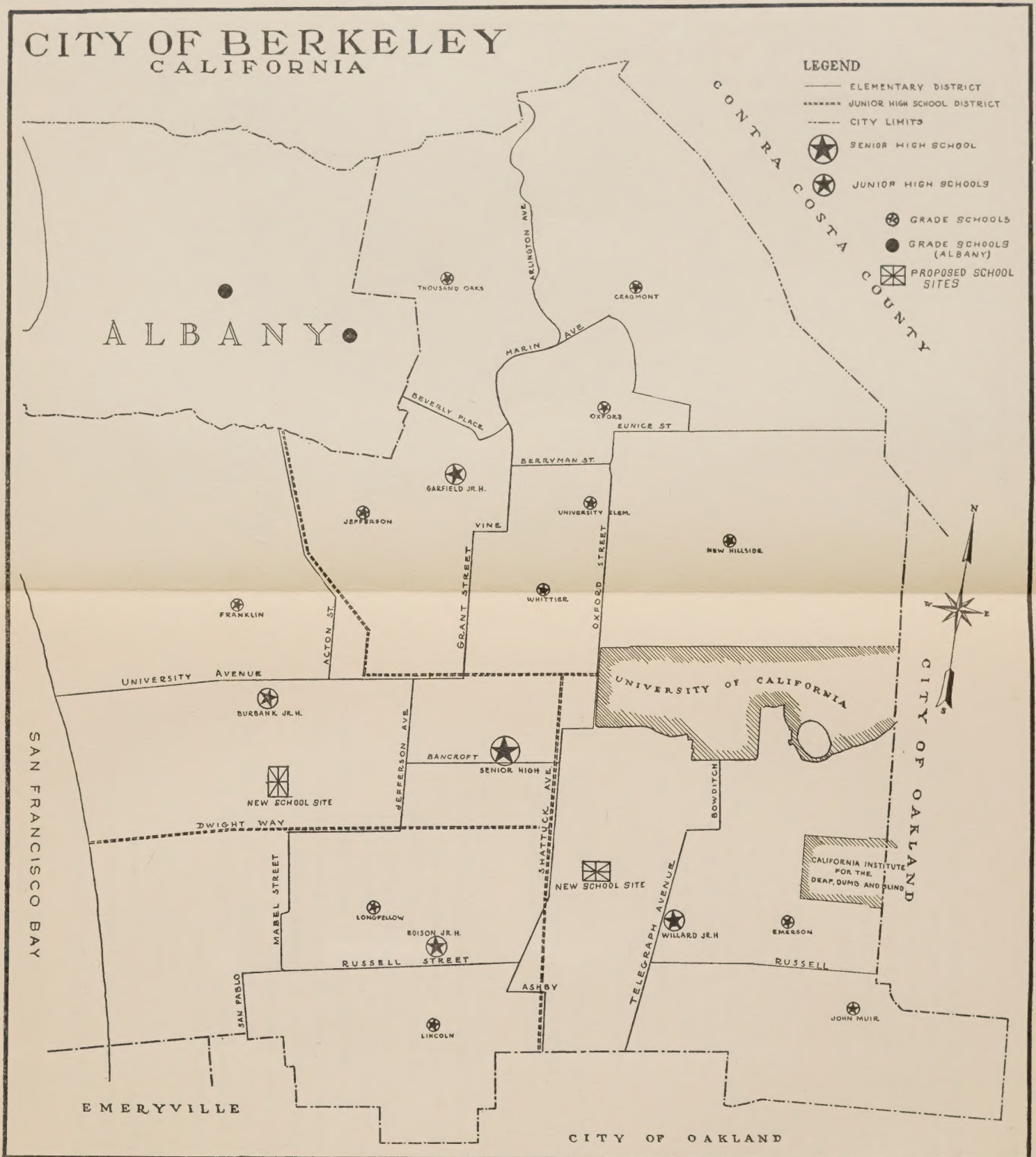


Figure 18
Map of Berkeley, showing plan of reorganization.

3. The advantages of the proposed reorganization are:

- a. It reduces the number of elementary schools by three, and ultimately by 5, and so provides larger instructional groups. Literally it replaces five schools with three and increases the sizes of five other schools besides. This is an educational and an economic gain.
- b. It gets the children of southwest Berkeley out of the way of expanding industries, giving them a more healthful and a safer school home.
- c. These changes can be effected without abandoning any building that ought not to be abandoned on other entirely legitimate grounds. That is, this desirable change can be brought about now at a minimum cost. This is a chance that does not come to a city often.
- d. All proposed new construction can anticipate the future quite as perfectly with as without this reorganization.
- e. This plan makes possible a fuller realization of the possibilities of expansion at Lincoln, Longfellow and Jefferson schools.
- f. It does not increase, but if anything decreases, the danger to the children from crossing busy thoroughfares.
- g. Not a single disadvantage to such a plan can be named.

EFFECT OF THIS REORGANIZATION ON PRESENT SCHOOL ENROLLMENT. The reorganization of the schools as here proposed would effect changes in the enrollment of schools as shown by Table XXXIX. These figures are based on an actual spot map count of children. It allows the districts of choice to stand as they are. This table also shows the estimated population for 1936.

It will be seen that this plan would give Berkeley five schools of 600 or more pupils at the present time, and with a fair prospect of at least seven of the 13 ultimately becoming schools of from 700 to 1250 pupils.

SECONDARY AND PART TIME SCHOOLS. In the matter of secondary schools it is recommended that the present system of organization be retained with only the following modification: That the present Garfield junior high school shall be converted into a six-year high school as soon as conditions at the present senior high school shall call for relief from further enrollment. When

TABLE XXXIX

HOW REORGANIZATION AFFECTS SCHOOL ENROLLMENT WITH ESTIMATE OF 1936 ENROLLMENT

	Est. 1936 Enrol.		Est. 1936 Enrol.
JOHN MUIR		COLUMBUS (Hawthorne-Washington)	
Present Enrol..... 325		Present Enrol..... 540	
From LeConte..... 41 366 New Enrol.		Add from Hawthorne.... 245	
—		Add from Longfellow.... 49	
Leaving all districts of choice as they are.....	450	Add from Washington... 156	
		990	1250
EMERSON		FRANKLIN	
Present Enrol..... 364 No change.....	400	Present Enrol..... 592 No change	800
LECONTE (McKinley)		WHITTIER (Washington)	
Present Enrol..... 400 400		Present Enrol..... 390	
Less loss to J. M.... 41		Lose to Jefferson..... 84	
Less loss to Linc.... 40 81		306	
—		Gain from Washington... 183	
319		Gain from Jefferson..... 1	
Add Total of McKinley.. 217		490	650
536	600		
LINCOLN		JEFFERSON	
Present Enrol..... 542		Present Enrol..... 458	
Add from LeConte..... 72		Gain from Whittier..... 84	
Add from Hawthorne.... 19		542	
—		Lose to Whittier..... 1 541	750
Total, New Lincoln..... 633	700		
LONGFELLOW		UNIVERSITY ELEMENTARY .. 229 No change	300
Present Enrol..... 533		OXFORD..... 209 No change	350
Lose on north to Col.... 49		CRAGMONT..... 145 No change	250
—		THOUSAND OAKS..... 565 No change	750
484			
Add on north from Wash. 255			
739	950		

the senior high school enrollment shall have reached 3000 it is recommended that this reorganization be initiated by permitting the Garfield school to retain its graduates and to care for the 10th grade pupils in the Albany section, if Albany shall have become a part of the Berkeley high school district. By thus adding one year at a time the transition will be easy and building needs can be rather definitely anticipated.

At the present rate of growth this change will likely need to be entered upon about 1929 or 1930 at latest. Ultimately, perhaps inside of ten years, this would give Garfield a population of over 3000. This should be regarded as a maximum size. As relief for this expansion it is believed that the present Oxford site is the most feasible solution. This is not, and can never be an ideal site, but it will be very costly if at all possible to get a suitable site in the region where the next junior high school should be located. The present University Elementary school site is too small even with full expansion possible in that block. It is conceivable that the Oxford pupils might for some purposes use part of the Garfield grounds. It will have to be recognized that any school in the Berkeley hills cannot have an ideal playground. While this means a special problem in physical and social education, it is not an entirely impossible one.

As to the part time school, the commission recommends that it retain its present quarters for the next few years, but that soon the Washington site be abandoned as an elementary school site, for which it is not well suited, and that a modern part time school plant replace the present old Washington structure.

4. THE PROPOSED PROGRAM OF BUILDING

In order to present a single summary view of the program of plant expansion that is here recommended, Table XL is presented, in which a complete list is arranged by buildings, with estimates of cost for land and construction.

The sum called for for elementary school buildings, together with present elementary school indebtedness, exceeds somewhat the legal maximum debt possible for this purpose. In order to present the full program of needs as the commission has determined them it seems wiser to proceed without reference to this fact, leaving to the Board of Education the task of adjusting this discrepancy. Before the proposed issue is made the present debt

will have been lessened somewhat, and the assessed wealth will have increased somewhat, both acting to lessen this discrepancy. This, with the suggestions set forth below under the heading *Order of Importance* (Page 162), will furnish the Board a ready means of reducing the figure. The chance seems fair that this can be met by reducing the bond issue to the legal limit and substituting for the amount of the reduction cash that will be obtained from sale of school property. With a view to emphasizing school needs and the full cost of meeting them, therefore, subsequent figures will be based on the assumption that the amount of the elementary school issue can be as here suggested, that is, large enough to cover actual needs.

TABLE XL
SUMMARY OF PROPOSED LAND PURCHASES AND
CONSTRUCTION WITH ESTIMATES OF COST

School—	Land	Construction	Total
Columbus	\$116,000	\$284,000	\$400,000
Whittier	32,500	137,282	169,782
Franklin—1st unit.....	52,500	284,000	336,500
Franklin—2nd unit.....			
Longfellow	5,500	110,400	115,900
Lincoln	40,000	43,114	83,114
Thousand Oaks		48,988	48,988
Jefferson		143,160	143,160
Le Conte-McKinley.....	175,000	136,624	311,624
Cragmont	5,750		5,750
Emerson	95,100		95,100
Oxford	13,000		13,000
	\$535,350	\$1,187,568	\$1,722,918
Burbank	42,900	79,600	122,500
Edison	15,200	123,848	139,048
Willard	145,400	136,472	281,872
Garfield		285,952	285,952
	\$203,500	\$625,872	\$829,372
High School		629,760	629,760
Part-Time		176,800	176,800
Move and alter Administration Bldg.		100,000	100,000
Elementary	535,350	1,187,568	1,722,918
Junior High Schools.....	203,500	625,872	829,372
Senior High School.....		629,760	629,760
Part-Time School		176,800	176,800
Administration Building		100,000	100,000
Administration Costs		16,150	16,150
Total.....	\$738,850	\$2,736,150	\$3,475,000

5. PROGRAM IN DETAIL BY SCHOOLS

High School

Present enrollment.....	2372
Estimated 1936 enrollment.....	3500
Maximum recommended.....	3500

Present academic building should receive additions to house entire high school with 3500 pupils.

Eventual aim should be to clear the block in front of the present academic building and convert it largely into a park and entrance to the high school plant.

Two main divisions, or wings, should be added to the main building, one of 30 classrooms for academic subjects, and one of at least 25 rooms or shops for special subjects, including space for printing, home economics, arts and crafts, art and commercial subjects.

Cost estimated at \$629,760.

Willard

Present enrollment.....	844
Estimated 1936 enrollment.....	1200

Buy land next to present holdings 89 feet on Ward Street, and 41.6 feet on Stuart Street. Also in the block across Stuart Street buy 269 feet on Stuart Street and 283 feet on Oregon Street. This would provide an adequate play space for this school, allowing for reasonable growth.

Add new construction, including:

- 19 classrooms
- Cafeteria
- Library
- 2 shops
- 2 domestic science rooms

Reorganize so as to give new administrative quarters.

Cost—Land	\$145,400
Construction	136,472

\$281,872

Garfield

Present enrollment.....	1029
Estimated 1936 enrollment.....	1500

Enlarge and complete assembly room.

Gymnasium for boys.

Gymnasium for girls.

New shops, cooking laboratories, sewing and millinery rooms, science room and art room.

Cafeteria.

Seven classrooms with plans for future expansion.

This school should become a six-year high school as soon as the present high school reaches enrollment of 3000. The change could be made by taking over one extra year of work at a time until full six years are provided for.

Cost estimated at \$285,952.

Edison

Present enrollment.....	701
Estimated 1936 enrollment.....	1000

Purchase additional land, 200 feet on Oregon Street.

Add to present plant as follows:

Library.

Cafeteria.

Two general science laboratories.

Shop additions.

Additions to domestic science rooms.

Ten classrooms, and enlarge assembly room.

Cost estimated:

For land.....	\$ 15,200
For construction.....	123,848
	\$139,048

Burbank

Present enrollment.....	527
Estimated 1936 enrollment.....	800

Purchase land in adjacent block east as follows:

224 ft. frontage on Curtis Street,
240 ft. frontage on Addison Street,
312 ft frontage on Browning Street.

Enlarge assembly hall (close typing room; move engine room stack, new entrance; new balcony; 10 new rooms; attach to domestic science building and one end of main buildings).

Cost—Land	\$ 42,900
Construction	79,600
	\$122,500

Hawthorne, Columbus, Washington

Present enrollment.....	613
When reorganized.....	990
Estimated enrollment in 1936.....	1250

Combine Hawthorne, Columbus, and about one-third of Washington districts into one district as per Fig. 18, with new site occupying block bounded by Channing, Browning, Bancroft, and Bonar streets.

Building should be among first constructed.

Should have 28 classrooms with extra rooms and special features in accord with standards set forth above for elementary schools.

Construct all but kindergarten and primary suites and about six classrooms, at once.

Complete primary-kindergarten section in 1928.

Estimated cost when complete:

Land	\$116,000
Construction	284,000
	\$400,000

In making transition the Columbus school can be used for one year as a kindergarten-primary school.

Washington group should be brought in and building completed in 1932.

After transition is complete present Columbus and Hawthorne sites can be sold.

Franklin

Present enrollment.....	609
Estimated enrollment in 1936.....	800

Purchase remaining portion of block now owned by school.

Erect new plant on east end of block. Could erect first half of plant at once to relieve the present conditions; then complete plant in about four years.

Later could sell the San Pablo frontage if desired. Site would be large enough without this.

Cost—Land	\$ 52,500
Construction, first unit.....	114,000
	\$166,500

To complete building for school of 800 pupils.....	\$170,000
Total construction.....	\$284,000
Total cost.....	\$336,500

Whittier

Present enrollment.....	390
Reorganized	490
Estimated 1936 enrollment.....	650

Add to present site 200 feet on Lincoln Street and 150 feet on Virginia Street.

Remove old buildings and erect new building complete.

When complete, includes present Whittier and about one-third of Washington school. See Figure 18 for new district lines.

The transition should be easy to make by locating new building just north of present building. Could build first unit, then remove out-buildings. Later, by very little wrecking, possibly none, the new plant could be completed.

Cost—Land	\$ 32,500
Building for 650 pupils.....	137,282
	\$169,782

Jefferson

Present enrollment.....	458
Estimated 1936 enrollment.....	750
Reorganized	541

Add five rooms as per plans and one kindergarten room.

Cost estimated.....	\$17,952
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To complete plant as per plans:

Construction	\$125,208
Total cost.....	\$143,160

Longfellow

Present enrollment.....	594
Reorganized	739
Estimated 1936 enrollment.....	950

Should do away with old buildings and cottages as soon as new classrooms are completed.

Complete new wing of 12 classrooms, cafeteria, cooking room, sewing room, and assembly room as per original plans.

Purchase 125 feet by 265 feet of ground across Derby Street.

Cost completed—Land.....	\$ 5,500
Construction	110,400
	\$115,900

Lincoln

Present enrollment.....	542
Reorganized	633
Estimated 1936 enrollment.....	700

Purchase additional land as follows:

112.92 feet fronting on Ellis Street,
110.92 feet fronting on King Street.

Add to west wing a group of six classrooms (two stories).

In basement of same wing, add cafeteria.

Complete assembly hall as planned.

Use present library for adjustment room and put library on second floor (Room 15 would be a suitable place).

Deaden ceiling of basement playrooms.

Cost for land.....	\$40,000
Cost for construction.....	43,114
	\$83,114

Emerson

Present enrollment.....	364
Estimated 1936 enrollment.....	450

Retain building as it is. The heating system should be modernized. The building will last as long as a school will be needed in that section. When the plant must finally be abandoned it should be possible to care for these pupils at the new Le Conte-McKinley and at the John Muir schools.

To make this a satisfactory plant for the 15 years or more during which it may be expected to serve, land should be purchased as follows:

162.6 feet frontage on Garber Street.
148.6 feet frontage on Forest Street.
Estimated cost, \$95,100.

LeConte-McKinley

Present enrollment—LeConte.....	400
McKinley	217
Reorganized	536
Estimated 1936 enrollment.....	600

Purchase new site, 375 feet by 270 feet, bounded by Carleton, Parker, Fulton and Ellsworth streets.

Erect new building complete.

Estimated cost—Land	\$175,000
Construction	136,624
Total cost.....	\$311,624

Thousand Oaks

Present enrollment.....	554
Estimated 1936 enrollment.....	750

Alterations and new additions as follows:

Stairway exit to playground next to the office.

Enlarge faculty room by moving partition toward library.

Change remainder of library to nurse's quarters, leaving space for a check room.

Arrange toilets to left and to right of east entrance.

Put library in classroom next to office.

In basement arrange for cafeteria.

Construct eight classrooms in second story over the east wing of the building.

Add balcony to assembly room.

Including the furniture the estimated cost will be \$48,988.

Other classrooms can be added to second story as required.

Cragmont

Present enrollment.....	145
Estimated 1936 enrollment.....	250

In addition to completing the plant now under way the play space should be enlarged to include Lot 27, between Spruce and Regal streets, and should be extended by 40 feet on Contra Costa Street.

Estimated cost, \$5,750.

Oxford

Present enrollment.....	209
Estimated 1936 enrollment.....	350

Aside from some alterations such as will provide an auditorium, it is recommended that no building be undertaken here until the time when it may be converted to a junior high school.

Some land might wisely be added at present, as follows:

Oxford frontage north of present site, 125 feet.

Estimated cost, \$13,000.

Part Time School

No attempt is made here to estimate the population to be served by this school.

Since part-time education on a large scale is in an experimental stage as yet, it is recommended that the school remain in the present quarters for the next three to five years, but that the Washington school site be reserved as a permanent site for this school, and that very soon the old Washington building be replaced by a modern plant especially designed for part-time school work. Probably by 1931 the present building can be vacated and construction of a part-time plant begun. A good plant can be provided at a cost of \$176,800.

Administrative Offices

The present administrative offices are entirely inadequate. It is suggested that the present high school science building could be reorganized within and turned around to face on Milvia Street and made into a very good administrative building for perhaps \$100,000. This would free the grounds, as elsewhere suggested, for use as a park and entrance to the high school.

6. UNITS OF CONSTRUCTION IN ORDER OF IMPORTANCE

Naturally in point of time, some parts of this program should take precedence over other parts. It would not be wise to try to put all the construction under way at once, nor is it assumed that this is necessary. This program is intended to cover all land purchases and all construction through a period of at least seven years. If construction is begun in the autumn of 1927 and completed by the autumn of 1932 it will have moved at a very satisfactory rate. No surprise need be felt if it requires a year longer. No one can perfectly anticipate market and labor conditions.

In order to suggest roughly where the need is greatest the following schedule of land purchase and construction is presented. There would doubtless be difference of opinion as to details, but it is believed that the following arrangement is in line with the urgency of the needs of the schools.

FOR THE PURCHASE OF LAND. The purchase of land need not be delayed until it is time for construction to begin. Naturally the market conditions should govern to some extent, though in general there is no evidence in this report that would suggest that

there will be a better time to purchase than the present. It recommends therefore, that:

1. Purchase of all lands called for in the above program be made at an early date.
2. That the standards suggested in this report (Appendix A) be applied from time to time to the school grounds as the schools grow in enrollment, and that needs be anticipated by as much time as possible.

As to sale of vacated lands, this is also a question of market conditions. It is safe to assume that the market will improve, so there should be no haste in this matter.

Before any land is sold, too, the question of its use for public playgrounds or parks should be gone over by the school board and the city council. The city must develop its park system, and some of the abandoned school sites might work into such development with good effect. If so, then it would be better for the schools to sell direct to the city and keep the commissions and profits in the pockets of the taxpayers.

No attempt should be made to sell these properties at once merely in order to turn the amounts obtained into the building fund. This would be poor economy, for it would add too little to alter the financial program to any extent, and it would probably result also in a low price.

FOR CONSTRUCTION. It should be made clear at the outset that this program has two definite ends to serve. One, to bring the school buildings up to the point where all pupils are properly housed. The other is to enter upon a continuous program of building that will keep the children housed from year to year.

The former we may refer to as the present urgent need suggested by Figure 8 (Page 108). It represents the accumulation during the past several years and marks the extent to which the city is behind in school house construction. The latter should be entered upon as soon as this present urgent need is met and then continue every year regularly as a normal part of the cost of schools.

This is a proposal that Berkeley shall shift from the policy of intermittent to the policy of continuous building. It takes the view that there is no essential difference between maintenance and outlay costs for building. To repair a roof and floor for one group

of children is no more important than to construct a new roof and floor for another group that has suddenly come into the schools for the first time. These new children should not be required to stand outside until several hundred or a thousand of them accumulate. Looked at in this simple human way, or looked at educationally, an intermittent program (except for small communities) is obviously wrong.

This first program may, in the judgment of this commission, be assumed to include:

1. New construction to replace:

Hawthorne, Columbus, Whittier, old Longfellow, old Jefferson, Washington, LeConte, McKinley. Cluster of old wooden high school buildings.

2. New construction to replace at least 80 percent of the temporary buildings. Temporary cottages may be and should be used to take care of overflow until enough new pupils have accumulated to call for a unit addition. The size of this unit will be different for different buildings, depending upon the type of architecture. It may be one or two or more rooms. About 20 percent of the present temporary structures in Berkeley may therefore be regarded as serving this very proper purpose now. The other 80 percent represent accumulations that ought to be at once converted into permanent construction.

As soon as this work has been completed it may be assumed that there will be a rest from building for not more than six months or a year, when somewhere there will be a school needing an addition of a unit of space. This will then go on regularly through the future. Now and then an old building will have to be replaced, and again, new enrollments will call for new additions.

If Berkeley will put through the construction as thus recommended it is the opinion of the commission that it will be possible at the end for the city to enter upon a pay-as-you-go policy in building. At present, as will be explained later, it is not possible to do this.

*Order of Importance**Land Purchases:*

1.	Willard	\$145,400
2.	Columbus	116,000
3.	Burbank	42,900
4.	Edison	15,200
5.	Emerson	95,100
6.	Whittier	32,500
7.	Lincoln	40,000
8.	Oxford	13,000
9.	Longfellow	5,500
10.	Franklin	52,500
11.	Cragmont	5,750
12.	Le Conte-McKinley.....	175,000
Total		\$738,850

Construction:

1.	Willard, complete as per program.....	\$126,472
2.	Senior High, special subject wing.....	260,000
3.	Columbus, upper grades unit.....	185,000
4.	Franklin, upper grades unit complete.....	114,000
5.	Burbank, complete as per plan.....	79,600
6.	Edison, complete as per plan.....	123,848
7.	Garfield, girls' gymnasium and classrooms.....	120,000
8.	Whittier, first unit (upper grades).....	85,000
9.	Jefferson, as per plan.....	17,950
10.	Longfellow, classroom section.....	80,000
11.	Lincoln, as per plan.....	43,114
12.	Thousand Oaks, as per plan.....	48,988
13.	Longfellow, auditorium and complete plans.....	30,400
14.	Senior High School, complete as per plan.....	369,760
15.	Garfield, complete as per plan.....	165,925
16.	Jefferson, complete as per plan.....	107,258
17.	Columbus, complete as per plan.....	99,000
18.	Le Conte-McKinley, new plant complete.....	136,624
19.	Part Time School, first section, new plant.....	100,000
20.	Franklin, complete plant.....	170,000
21.	Whittier, complete as per plan.....	52,282
22.	Part Time School, complete as per plan.....	76,800
23.	Administration building.....	100,000

The above program is the unreserved recommendation of this survey.

1. The program is worked out with reference to a single unified purpose and viewpoint.

2. It covers what the Commission believes will be the total amount of construction needed through a period of seven years.

3. It will place all the schools in good houses and on adequate grounds.

4. With proper maintenance no additional building of large cost will be required for several years unless Oxford school is rebuilt for a junior high school plant.

5. It does not call for elaborate and costly construction, but it does call for construction that is sound.

6. At the conclusion of this program it should be possible for Berkeley to enter upon a pay-as-you-go policy for future construction, at least for a long period of years.

7. It furnishes the people of the city a definite basis for estimating school costs through a period of years, and a definite basis for checking their school officers and school policies, in the matter of schoolhouse construction.

8. The proposed plan for financing this program has been worked out with proper regard for other debt obligations, and for the needs of other departments of the city government.

6. A SMALLER PROGRAM POSSIBLE

It would be possible to reduce this program by either of two methods. First, by accepting a lower standard of school homes for the city's children. Second, by accepting a program that covers the immediate needs only and not those of four to six years hence.

The former is not recommended because the facts presented in this report show that:

1. Berkeley is amply able to pay for as good school homes as are called for in this program.

2. Lower standards would be inconsistent with the plan and the machinery of instruction now in operation, and with the present standards of culture of the people of this city.

3. Lower standards mean less safety for the children.

The second method of reducing this program is not recommended because:

1. With a single program there can and will be unity and continuity of policy. If this plan is shortened it merely means that

when the plan is finished, say in three years, then it will be necessary to start another plan, for the slack in building needs will not have been taken up. This means that a new start must be taken, and that much that will have been done in this survey to produce a unified scheme of school house planning will have been wasted. There is no certainty of continuity in either legislative or executive control of the schools over a long period, and for that reason a program that is projected over a period of seven years is certain to be a stabilizing influence.

2. There would be no saving in cost and, in fact, there would be loss. If the city stops with, say half or two-thirds of the above program, it will almost surely require a second bond issue, and the two issues will undoubtedly total more than this one, and will delay longer the entrance upon a cash basis.

3. There would be less satisfaction from an educational standpoint. School officers could not count definitely upon the future and so would resort to hand-to-mouth methods which are educationally wasteful and economically wasteful.

7. AN ALTERNATIVE PROGRAM

Realizing that, while every educational, every economic, and every social reason points clearly to the soundness of the single long distance planning, the writer appreciates that there may still be personal feelings to the contrary. Thinking of this as at least a possibility, the program has been gone over with care and from it there has been compiled a lesser program which covers only immediate pressing needs.

These needs are listed below, with estimates and with notes of what has been left out of the above program. In brief it carries out some less than two-thirds of the above program. It leaves the Le Conte, the McKinley and the Washington buildings as they are. It leaves the high school without an auditorium and otherwise only half completed. It leaves the Willard, Edison and Garfield incomplete, and abbreviates work at several other points. Also it omits the purchase of land which will have to be purchased later,—likely at a higher cost.

Program of Immediate Necessities

I. CONSTRUCTION:

High school.....	\$350,000
Omit academic unit and auditorium.	
Willard	113,190
Omit cafeteria and retain old cottages.	
Edison	100,010
Omit assembly alterations and extensions.	
Garfield	224,940
Omit assembly alterations, boys' gymnasium and cafeteria.	
Burbank	63,600
Omit assembly alterations.	
Columbus-Hawthorne	200,000
Retain Washington Bldg. and decrease size of new plant by about 7 classrooms.	
Whittier	105,000
Omit the addition of pupils from Washington and make smaller plant.	
Longfellow	90,000
Omit auditorium.	
Franklin (first unit only).....	131,200
Thousand Oaks	35,000
Omit alterations and assembly balcony.	
Lincoln	23,000
Leave assembly and playrooms as they are and add but 4 classrooms instead of 6.	
Jefferson (retain old building).....	17,952
Le Conte-McKinley	
Repair and retain these old buildings in use.	
Part-Time School	
Keep old plant in repair and leave Washington to be repaired and kept for present use.	

 \$1,453,892

II. LAND:

Columbus-Hawthorne	\$116,000
Lincoln	40,000
Whittier	29,500
Emerson	40,000
Burbank	42,900
Edison	15,200
Willard	145,400

Construction	\$1,453,892
Land	429,000
Administration	10,108

 \$1,893,000

CHAPTER VII

A PLAN FOR FINANCING THE PROGRAM

THE TOTAL COST. The program that has been set forth above as the recommendation of this survey calls for a total outlay of \$3,475,000. Of this sum \$1,722,918 is for elementary schools; \$829,372 is for junior high schools; \$629,760 is for senior high school; \$176,800 is for a part-time school; \$100,000 is for an administration building, and \$16,150 is for handling the administrative costs for elections, issuance of bonds and other necessary charges.

THE COST IN THE LIGHT OF NEEDS. It may seem to the taxpayer that this is a relatively large sum for Berkeley to spend on a school plant. Viewed as an isolated figure it is large. Viewed from the two angles that really reveal the meaning of the figure it cannot be regarded as an unreasonable expenditure. Any expenditure, either public or private, should be considered, first from the standpoint of what it is to buy, and second, from the standpoint of the economic burden it involves.

If good school buildings are not needed, or if they are not wanted, then any sum is too much to pay for them. It is believed that this report has fully established the fact that Berkeley needs just what has been outlined in this program. Not a thing has been put into the program that was not regarded as answering a definite need. The estimates allow for no fancy frills in buildings, but they do look to the safety of the children and they do look to the wearing quality of construction. It may be said here that it would have been a simple matter to have listed other things that would have lifted the total cost estimate by at least a half million dollars. These things were omitted, however, in the interest of what is believed to be a sound economy in the management of public education in Berkeley.

Whether the people of Berkeley want good school buildings is a different matter, and one with which a survey has no proper concern. In Berkeley, however, there is little doubt that the wants are fully abreast of the needs, and the statement that the plan presented in this report is based upon needs and upon a sound policy of business economy is probably the equivalent of

saying that it is based upon the actual wants of the parents of the children of the city or of the taxpayers of the city.

THE COST VIEWED AS ECONOMIC BURDEN. The second point, that the total proposed figure must be judged in the light of the economic burden it involves, is an equally important basis for judging the size of this total figure. The burden may be great for either of two reasons. We may adjust the burden badly, or we may take on too large a burden.

In the first place, this sum is to cover seven years of building. At the end of this time the city will have all the children of the city properly housed and, unless the city grows much faster than anyone estimates, there should be very few of the buildings that will be so crowded as to require additions at that time. In other words, this sum is to cover all needs for land and buildings through a period of seven years at least.

We must not try to blind ourselves to the fact that these needs exist, and that if they are to be met it will take approximately the sums here proposed. Less than this sum will buy less than is needed, to be sure, but it will not buy all that is needed. Hence, to provide less means to have a shorter period of construction. Three years of construction very likely could be carried on for \$2,000,000, but it would end and the city would simply have to start all over on another plan.

The sum of \$3,475,000 spread through a seven-year period is an average of but \$496,428.58 per year. We need to consider, too, that this provides buildings that will have a life of 40 to 60 years. Thus, viewed from the standpoint of the extent of the program and the annual cost for housing and the future demands for added expenditures the sum seems relatively small. It is in reality a case of pay the cost or do without, as it is in our private affairs. Buying a half or a third of what we ought to have does not satisfy us and it is no better economy for the public than it is for the individual to buy in small packages. We pay dearly for the wrapping and the containers whether we buy tooth paste or school buildings.

The other economic measure of the burden proposed by the plan asks: How would such an obligation affect our tax rates? How heavy would it make our debt? The answer to these questions can be given in fairly tangible form.

Let us assume that this sum had to be raised in 1927.

If raised by tax it would add slightly over 65 mills on the dollar assessed wealth to the tax rate.¹ That is, it would increase the tax rate by 130 percent over that of 1925.

If raised in seven equal parts through seven years it would add 9.1 mills the first year and then 8.9; 8.6; 8.3; 8.0; 7.8; 7.5 mills, respectively, in the following years.²

If assumed as a debt in 1927 it would add \$50.03 per capita to the present debt.³ Berkeley's total net debt in 1925 was \$42.24 per capita. See Table XXXVI. In the same year San Diego's debt was \$138.90 per capita, and that for Long Beach was \$147.31. Berkeley's would be but \$92.28.

If assumed as a debt in 1927 then the interest due in 1928 (at 5 percent) would be \$173,750. This would call for a tax of 3.1 mills on the dollar.

From these facts it is clear that no one could reasonably suggest raising the total amount in one year. As a matter of common sense and reasonable equity it should not be raised in one year, not only because it would be too heavy a tax, but also, because that much ought not to be spent on building in a city of Berkeley's size in one year. It would very obviously cause the price of all labor and possibly of some materials to go up.

It is just as obvious from these measures of the load that if properly distributed over a period by means of a loan it would not seriously impair Berkeley's credit nor involve an interest obligation that is of any serious consequence. If twice as much principal as interest were paid each year then the tax that would be added the first year would be but 9.3 mills.

This is not meant to suggest the best way to finance this program. It is offered here merely as a means of sizing up the economic burden that this program would involve as a single proposition.

¹ Based upon the assumption that the county assessment roll for 1927 would be \$53,385,000.

² Based on the assumption that the assessed wealth would increase at the rate of \$2,000,000 annually. This is less than the average increase of the past five years.

³ Using census estimate of 1927 population.

2. THE FINANCIAL POLICY

There are two general policies that are being used by cities over the country in the matter of financing school buildings. These may be characterized as the bonding policy, and the pay-as-you-go policy. For brevity we may refer to the one as a credit and the other as cash policy. There are various combinations of the two to be found if we examine the actual plans in use, but the two stand for distinct viewpoints and each has its adherents.

The credit plan is best adapted to, and is usually essential to *intermittent construction* as a policy of developing a school plant. If we huddle our construction into lumps we must pay the cost in lumps or else find a way to spread the cost out over subsequent years. The cash plan is adapted to *continuous construction* as a policy because the cost comes in small, regular allotments which adjust themselves comfortably to the requirements of a sound taxing system.

The writer would take the position that, other things being equally suited to the two plans, there is no doubt that for public financing the cash plan is the better. There can be no proper social gain in borrowing for the sake of putting off payment. This is different in private finance, where the end sought is profits and not social service.

On the other hand, we must not be led into the assumption that there is any special virtue in any given plan as such. A plan in public financing is good or poor accordingly as it meets or does not meet actual needs. These needs are:

1. To get the money when and for the time and purposes needed, and
2. To get it at the lowest net cost consistent with the money market and with wise management in its use.

One has only to turn to Figure 17 and to Table XXVIII in this report to see that the credit method is costly. Berkeley has paid almost twice for the buildings built by the credit plan. Some one replies that the taxpayer lost nothing since, while he was paying interest he had the tax money he would have paid out by the cash plan, and that with that tax money he earned more than the additional cost involved in the credit plan. That argument is very thin. If it were true then we ought to pay all public bills by the credit method.

On the other hand we might better ask whether Berkeley could have had school buildings at all had the cash plan been the only possible one. The answer is probably no, or if so, then at a tax rate that would be next to intolerable. That is, public borrowing is resorted to out of necessity and never with the thought of financial gain to the tax payer.

There is the question of equity, to be sure. One may ask, why should this generation pay for buildings to house the children of one or two generations hence? The answer to this is: first, there is some justice in this viewpoint, so far as bare logic is concerned, yet, if we treated succeeding generations strictly on the basis of equity alone, and not on the simple human basis, it is doubtful if society would hold together. One thing is sure, if the equity standard were applied by an outside party we would have to cease robbing future generations of their proper right to some of the natural resources of the country which we are rapidly and ruthlessly consuming. Also, we should have to quit bonding in ways that carry debt far beyond the life of the building for which the debt is assumed. Surely we should not go into debt merely in order to carry out this idea of equity as between present and future generations.

What is needed is a simple common sense view of the case. Go in debt if we cannot pay cash, and for that reason alone, is a good rule. To apply this rule though, requires that we decide whether or not we are able to pay cash. This is very easy in extreme cases, and difficult in others. There is no tax rate that is so small that it does not operate as a real burden to some, and there are others for whom a very high tax would not be a burden. From this fact we may conclude that it is not reasonable to expect unanimous agreement in the matter in any community.

This matter may be made clear by an illustration. Take a small town with one school. Let it be a growing town. They should build beyond present needs. This costs a large sum, too large to raise by tax, so they must borrow. They bond and spread the cost over a period of 20 years. At the end of this time they must build an additional unit of two rooms. Then they may run a few years and be compelled to put up a second building. Again the sum is large and they borrow. Thus, since the building needs come only at intervals, borrowing cannot be prevented. As time goes on these demands for new buildings come closer together.

Finally they reach a point where the demand is almost continuous. Then it is that the town, now grown to be a city, should change over to a cash basis.

Normally the following is what happens: Instead of keeping abreast of needs, we allow construction to get behind. We seem to assume that because at the beginning we had to build only at wide intervals of time, we should continue to do so. The result is that when we should begin to try to get construction over to a continuous basis we are not able to do so without first overcoming a gigantic handicap of past neglect. This is exactly where Berkeley is today. Berkeley could not possibly meet even the most urgent of present necessities by a pay-as-you-go plan. The only possible hope of getting over to a cash basis in Berkeley is for the district to borrow money on a reasonably short term plan, so that in the lull after most of the debt is paid there may be a chance to shift to a cash basis. This is the recommendation of this survey.

3. THE FINANCIAL PLAN RECOMMENDED

If Berkeley were abreast of present school building needs this report would recommend a cash policy. As it is, with construction of close to \$3,000,000 in cost now accumulated, and much of it really urgently needed, such a recommendation cannot be made.

With reluctance we must turn to the next best alternative, which is to spread out this large initial cost over a period of years. This has to be done or worse conditions still will be inevitable. What is proposed, however, is that, while a pay-as-you-go policy cannot be entered upon now it must stand as one of the important goals to be attained at as early a time as possible. The commission is confident that this transition can be made at the end of the building program recommended by this report. The basis of this opinion will be set forth below. Here will be presented the plan that is recommended by the survey commission.

STATEMENT OF THE FINANCIAL PLAN. It is proposed to outline here a plan for financing the recommended program. If the Board of Education believes it wiser not to attempt to handle the entire needs as set forth in this program, and prefers to undertake less, as illustrated by the suggested alternative program outlined above, covering the barest immediate necessities only, then it is believed that the figures here proposed will still serve the purpose of illustrating the principles to be followed.

It is recommended:

1. That the entire program be entered upon at once in a single financial plan, and accordingly
2. That bonds be issued in the sum of \$3,475,000.
3. That the bonds be dated October 1st, 1927 (or April, 1927).

That the bonds be sold in lots as follows, or as market conditions and planning the construction dictate:

- a. October, 1927, \$1,000,000
 - b. October, 1928, 750,000
 - c. October, 1929, 500,000
 - d. October, 1930, 500,000
 - e. October, 1931, 500,000
 - f. October, 1932, 225,000
5. That the bonds be serial in arrangement for liquidation and be paid off in the following manner:
 - a. All interest due and \$100,000 in principal annually the first three years, 1928 to 1930 inclusive.
 - b. All interest due and \$150,000 in principal annually for three years, 1931 to 1933 inclusive.
 - c. All interest due and \$175,000 in principal annually for three years, 1938 to 1940 inclusive.
 - d. All interest due and \$185,000 in principal annually for three years, 1938 to 1940 inclusive.
 - e. All interest due and \$200,000 in principal annually for five years, 1941 to 1945 inclusive.
 - f. All interest due and principal of \$225,000 annually for two years, 1946 and 1947, completing liquidation.

EXPLANATION OF THE PLAN. This plan is meant to embody principles and is presented in some respects as an illustration only. As to the total sum the commission believes that Berkeley will follow better principles of economy by facing the schools' needs as a single issue. It is conceivable, however, that payments of the bonds might cover a period of 25 instead of 20 years. The writer believes that it is desirable to make the period as short as possible in order to have the schools practically out of debt by 1947. The special reason for this will be given below.

The interest dates of the bonds should fall as close as possible to the dates when tax money is received, probably in April and October, or May and November.

The bonds should be sold as the money is needed. Doubtless they could be sold in smaller blocks than the plan suggested without loss in price. If the bonds were all sold at once much of the money would lie idle for a long time, for construction should not go forward at a rate greatly beyond a half million dollars a year. The arrangement proposed has in mind that in the first year the construction might run to \$650,000 because of the urgent need at so many points, and a large start made on land purchases. In the second year land purchases could be carried well toward conclusion and at least a half million dollars of construction carried out. From then forward the plan would be fairly regular until the last year, when the end would be reached. By lightening construction in the last year it eases off the labor adjustment through a period long enough so that there need be no loss to workmen from a sudden slump in building.

It is estimated that the work will extend through a seven-year period, though sale of bonds in the plan is adjusted to a six-year period in order that money may be available slightly in advance for dates of bond sales.

There may be some extra expense connected with selling the bonds in several blocks, though the net gain by such a plan is large. If the bonds were all sold at the outset the total interest cost on the issue would be \$2,028,500. By the plan above outlined a saving of \$317,500 would be effected, bringing total interest cost down to \$1,711,000. It is possible that the Board may be able to gain slightly more than this by more accurate adjustments than can be anticipated so far ahead of time.

It is suggested that construction be started as soon as possible. The date October is suggested above. If the date could be the April preceding, it would likely be better. The spring market is usually more favorable for bonds of this character.

The payments on the principal are so arranged as to make the payments light during the first three years. The reason for this is made clear by reference to Figure 17. The present school debt (the city has almost no other debts) is being paid off rapidly, but the actual burden is still large. The load reached its highest point in 1923, when the payments of interest and principal combined

amounted to \$244,409.37. Two of the 1906 issues will be paid off next year and interest charges are declining at a fair rate.

The largest single payment required will be in 1934, when construction is completed. In that year the payment, including principal and interest due, will amount to \$311,250, which is a little more than the highest payment on past issues, made in 1923. Combined with the \$184,222.50 that will have to be paid on the old issues the total amount due in 1934 will be \$495,470.50. In 1923 the tax rate necessary to cover the payment due was 56 cents on the \$100 valuation. In 1934, allowing for the very conservative estimate of a regular annual increase in the tax roll of only \$2,000,000¹, the rate required to pay the amounts due on the old debts at that time will be 27 cents on the \$100 valuation. To make the payment on the new debt will require a rate of 46.1 cents. The debt payment in that one year will then total 73.5 cents. The highest rate that will be reached will be 76.4 cents in 1931, after which the decline will be rapid.

In order to make clear just what the situation will be from year to year Table XLI is presented. This table shows the entire plan and what it will mean in tax rate and what it will mean to three different taxpayers. This table has reference to the handling of the proposed bond issue only. In column 1 is shown the date when interest will be due.² In column 2 is shown the amount sold by years. In column 3 is shown the total outstanding debt upon which interest will be due that year. In column 4 is entered the proposed payments on principal. Column 5 shows the interest due and column 6 the total sum to be paid. In column 7 is the taxable wealth, estimated on a very conservative basis. In column 8 is the tax rate necessary to pay the amounts in column 6.

Let us assume that bonds are issued and \$1,000,000 worth sold in 1927. Then in 1928 there would be interest due on this million. Our table shows that at a 5 per cent rate, which is undoubtedly higher than Berkeley will have to pay, there would be \$50,000 of interest falling due in 1928. By paying \$100,000 on the principal the amount to be paid for that year would be \$150,000. This

¹ The average increase in the past five years has been over a quarter of a million dollars more than this.

² Interest will doubtless be paid semi-annually. This table will illustrate quite as well and with less detail by presenting it by years instead of half years. The bonds can be made payable into blocks per year to fit interest payment dates.

TABLE XLI

PLAN FOR LIQUIDATING PROPOSED BONDED INDEBTEDNESS IN TWENTY YEARS, WITH ILLUSTRATIONS
OF ACTUAL TAX BURDEN INVOLVED

Date	Bonds Outstanding		Amount to be Paid by Years			Assessed Wealth (Est.) ¹	Tax Rate Needed per \$100	Actual Tax Paid by One whose Property is Assessed at		
	Amount Sold by Years	Total upon which Interest is Due	Principal	Interest	Total to Pay			\$1,000	\$5,000	\$20,000
1928	\$1,000,000	\$1,000,000	\$100,000	\$ 50,000	\$150,000	\$55,385,000	\$0.270	\$2.70	\$13.50	\$54.00
1929	750,000	1,650,000	100,000	82,500	182,500	57,385,000	.318	3.18	15.90	63.60
1930	500,000	2,050,000	100,000	102,500	202,500	59,385,000	.341	3.41	17.05	68.20
1931	500,000	2,450,000	150,000	122,500	272,000	61,385,000	.443	4.43	22.15	88.60
1932	500,000	2,800,000	150,000	140,000	290,000	63,385,000	.457	4.57	22.85	91.40
1933	225,000	2,875,000	150,000	143,750	293,750	65,385,000	.449	4.49	22.45	89.80
1934	.....	2,725,000	175,000	136,250	311,250	67,385,000	.461	4.61	23.05	92.20
1935	.....	2,550,000	175,000	127,500	302,500	69,385,000	.436	4.36	21.80	87.20
1936	.....	2,375,000	175,000	118,750	293,750	71,385,000	.411	4.11	20.55	82.20
1937	.....	2,200,000	175,000	110,000	285,000	73,385,000	.388	3.88	19.40	77.60
1938	.....	2,025,000	185,000	101,250	286,250	75,385,000	.379	3.79	18.95	75.80
1939	.....	1,840,000	185,000	92,000	277,000	77,385,000	.358	3.58	17.90	71.60
1940	.....	1,655,000	185,000	82,750	267,750	79,385,000	.337	3.37	16.85	67.40
1941	.....	1,470,000	200,000	73,500	273,500	81,385,000	.336	3.36	16.80	67.20
1942	.....	1,270,000	200,000	63,500	263,500	83,385,000	.316	3.16	15.80	63.20
1943	.....	1,070,000	200,000	53,500	253,500	85,385,000	.296	2.96	14.80	59.20
1944	.....	870,000	200,000	43,500	243,500	87,385,000	.278	2.78	13.90	55.60
1945	.....	670,000	220,000	33,500	253,500	89,385,000	.283	2.83	14.15	56.60
1946	.....	450,000	225,000	22,500	247,500	91,385,000	.270	2.70	13.50	54.00
1947	.....	225,000	225,000	11,250	236,250	93,385,000	.252	2.52	12.60	50.40

1. Average increase in taxable wealth during last five years—\$2,268,180. Here it will be assumed that the increase will continue through this period at the rate of \$2,000,000 per year. See Table 28 for tax roll figures.

would mean a tax rate of 27 cents added to the usual rate. The remainder of the table reads in the same way.

4. EFFECT OF THE PLAN ON TAXES

No attempt will be made here to show that Berkeley can have good school buildings for nothing, or even for a trifle. On the other hand it must be remembered that we all hate taxes and are more excited over a slight increase in a tax than we are by equal charges from almost any other source. Accordingly we must not try to make this burden look like a mountain. It is a real charge that will take real money and mean increase in taxes. It is not so great, however, that we should be afraid to undertake the task.

First, the estimates presented are all very conservative. The rate of increase in tax roll will certainly not be under \$2,000,000 a year. There is almost no doubt that that estimate is over-conservative. It has averaged more than that in the past five years. Second, Berkeley will get a large premium on 5 per cent bonds, and the writer will be surprised if the actual interest charge is as high as 4.6 per cent. Yet, the estimate here is on the basis of a 5 per cent interest charge. Third, the estimates on cost of construction are based on construction prices of today. It is not unreasonable to think that these prices will come down somewhat in the near future.

All these facts suggest the possibility that the actual effect of this bond issue on the tax rates may be less than is estimated in Table XLI. It is virtually certain not to be greater. We may fairly conclude therefore, that this report has asked for a program, every particle of which is actually needed, and that it has been very conservative in estimating the consequences of the plan if it is undertaken.

In Table XLI the last three columns show just what the debt payments would mean to three typical citizens in Berkeley. These three citizens have property assessed at \$1000, \$5000, and \$20,000 respectively. In 1928 the first would have \$2.70 added to his tax bill, the second would have \$13.50, and the third \$54.00. The next year these amounts would be increased slightly, as they would be through the next few years. They would reach their highest point, however, in 1934, when they would cost these three taxpayers \$4.61, \$23.05, and \$92.20 respectively.

As is explained elsewhere in this report, the weight of the bur-

den of a tax depends in part upon how we feel about it. It is reasonable for each citizen in Berkeley to ask himself: Just how serious will that demand be to me. And he should answer his own question by recalling similar amounts he has paid to his church; to his Rotary, Lions, Exchange, Kiwanians, or other club; to perfectly useless advertising; to political parties; to any one of the continuous calls that come month after month. Having faced these old payments with which he is familiar, he should then ask: Did any of these buy me more than I will get for this tax? The answer can rarely be more than one thing if all the facts are honestly faced, and that answer will be, *No*.

The matter is very personal, however, and much depends upon our attitude toward the fundamental principles of public education. We must not too soon forget what the boys said when they came back from France. They saw what neither they, nor we, had ever seen so fully and clearly before, that public education is the foundation upon which the essence of our freedom and of our national greatness rests. The boys backed up their statements by going back to school in larger numbers than had ever before been known.

Much depends, too, upon the attitude we take toward our own city. If we are more interested in our own neighborhood than we are in our city, and more interested in our local improvement club than we are in our schools, then any added tax for a general city purpose will seem large. On the other hand, if we believe in our home city, and have the vision to see that the attitude and the courage and the business acumen that have made America great can be applied in making our home city an aggressive, forward looking enterprise, then these sums added to our tax bills will seem small.

The writer does not need to tell the people of Berkeley how they ought to feel about the cost of this undertaking. It is the business of a survey to show the full facts about needs and about costs. Attempt has been made here to show the nature of the burden the cost will represent, and it is a plain fact that our size-up of the burden depends upon how we feel about public education, about our city, and about our schools. In this matter this report wishes only to make the reader properly conscious of the situation and of the proper responsibilities of a citizen.

In order to show the full story of school debt obligations, Table XLII is presented. This table shows for past school debts all

TABLE XLII

TOTAL SCHOOL DEBT PAYMENTS BY YEARS FROM 1928 IF PLAN
IS ADOPTED

Year	Old Debts Combined		New Debt Payments		Total Payments All School Debts	Tax Rate Per \$100 ¹
	Principal	Interest	Principal	Interest		
1928	\$86,250	\$123,405.00	\$100,000	\$50,000	\$359,655.00	Cents 64.8
1929	86,250	119,166.25	100,000	82,500	387,916.25	67.5
1930	86,250	114,927.50	100,000	102,500	403,677.50	67.9
1931	86,250	110,688.75	150,000	122,500	469,438.75	76.4
1932	86,250	106,450.00	150,000	140,000	482,700.00	76.1
1933	86,250	102,211.25	150,000	143,750	482,211.25	73.7
1934	86,250	97,972.50	175,000	136,250	495,472.50	73.5
1935	86,250	93,733.75	175,000	127,500	482,483.75	69.5
1936	86,250	89,495.00	175,000	118,750	469,495.00	65.7
1937	86,250	85,056.25	175,000	110,000	456,506.25	62.2
1938	86,250	81,017.50	185,000	101,250	453,617.50	60.1
1939	86,250	76,778.75	185,000	92,000	440,028.75	56.8
1940	86,250	72,540.00	185,000	82,750	426,540.00	53.7
1941	86,250	68,301.25	200,000	73,500	428,051.25	52.5
1942	83,750	64,062.50	200,000	63,500	411,312.50	49.3
1943	83,750	59,936.25	200,000	53,500	397,186.25	46.5
1944	83,750	55,810.00	200,000	43,500	383,060.00	43.8
1945	83,750	51,683.75	220,000	33,500	388,933.75	43.5
1946	83,750	47,557.50	225,000	22,500	378,807.50	41.4
1947	83,750	43,431.25	225,000	11,250	363,431.25	38.8
1948	81,250	39,305.00	.....	.....	120,555.00	12.6
1949	80,750	35,291.25	.....	.....	116,041.25	11.9
1950	71,500	31,300.00	.....	.....	102,800.00	10.5
1951	71,500	27,725.00	.....	.....	99,225.00	9.9
1952	71,500	24,150.00	.....	.....	95,650.00	9.4
1953	71,500	20,575.00	.....	.....	92,075.00	8.9
1954	71,500	17,000.00	.....	.....	88,500.00	8.3
1955	71,500	13,425.00	.....	.....	84,985.00	7.9
1956	59,000	9,850.00	.....	.....	68,850.00	6.2
1957	59,000	6,900.00	.....	.....	65,900.00	5.9
1958	54,000	3,950.00	.....	.....	57,950.00	5.1
1959	25,000	1,250.00	.....	.....	26,250.00	2.2

1. This rate is computed on the assumption that assessed wealth will increase \$2,000.0 annually. The average increase of the past five years was considerably more than this.

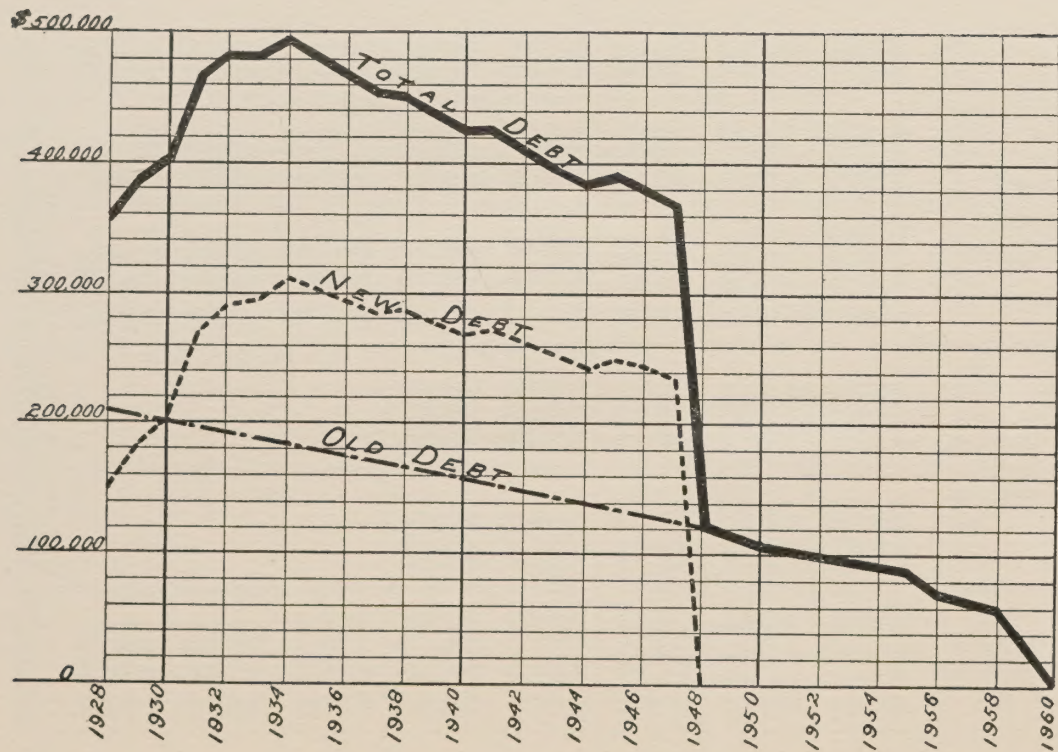


Figure 19

Total school debt payments by years from 1928, if plan is adopted.

combined, and for the proposed new debt, the interest and principal payments by years, from 1928 to the final payment of all debts. Inasmuch as Berkeley has almost no debt beyond this, it should be kept in mind that this is practically a complete picture of Berkeley's total debt situation. In order to show the trend of the payments to the end of the obligations, Figure 19 is introduced to show the figures of this table in a graphic form.

From the three curves the distribution of the old and of the new debt payments separately and in combination are clearly shown. It will be noticed that the old debt payments decline at a regular rate and run on to 1959. The payments on the new debt are not similarly adjusted. The payments are light at the outset and reach their highest point in 1934, and end in 1958. When the two curves are combined in the total debt curve we see that in toto the debt will not be evenly spread out. The point is that if Berkeley fails to shift to a cash basis in the 40's the chances are that it will be very difficult to get away from the necessity for another school bond issue in the late 40's or early 50's. As to having the curve low at the outset, that seems wise merely in order that the steps to a higher debt charge may be gradual. Further, as noted above, when the actual assessed wealth is known this curve will be more nearly level when it is expressed in the form of a tax rate.

5. POSSIBILITIES OF A PAY-AS-YOU-GO POLICY FOR FINANCING BERKELEY'S SCHOOLS

It was stated above that if the program were carried to completion as presented in this report it seemed reasonable to believe that Berkeley could then put schoolhouse construction on a cash basis. The reasons for this conviction will now be set forth.

The following points must be kept in mind:

1. Schools are but one of Berkeley's needs.
2. Schools constitute a major public interest and require a major position in the public budget.
3. Berkeley is not seriously behind in its other needs at the present time.
4. Some time in the future Berkeley will want to develop its water-front, add to its park system and likely to its city hall. These are not pressing needs at present.

5. Because the schools are in urgent need and because the other public needs are not pressing, now is the time to give the schools the right-of-way and bring them up to a position where they will not make these other developments impossible when they shall be needed.
6. Since these other calls are sure to come, it is urgent that the schools be gotten onto a cash basis and out of the way at a reasonably early time.

In order to try to anticipate what the schools will demand in the future and how these demands will be spread out over the years, Table XLIII is presented. In this table is listed the school buildings as they will stand at the conclusion of the proposed building program. Over against each school is the estimated date on which we may reasonably expect that the building will have to be rebuilt. These dates are only rough estimates, to be sure, but they are far better than no estimates. It will be seen that a long life is allowed to all the new construction. Sixty years must be regarded as probably the very outside, and even with the best materials and workmanship and planning we can hope for little more than this table suggests.

If we examine this table by decades we will note first, that following the completion of the program in 1934 there appears to be no new building to add before 1940. That does not mean that there will be no construction between 1934 and 1940. Obviously there will be a call every year for additional units to carry increases in population. These will not be large though, and it should be possible to carry them as maintenance charges are carried, by keeping the building tax that has been in use recently. It of course cannot be done for nothing, and not to do it would be to doom the hope of carrying building costs on a pay-as-you-go basis.

During the 40's two buildings will have to be abandoned.

This report advises that these schools be permanently abandoned then, and the University-Elementary even sooner, as explained elsewhere. This would mean less costly construction to be added at the new Le Conte-McKinley and the John Muir schools for the Emerson pupils, and at the Hillside, Whittier and Jefferson for the UniversityElementary group.

The main point to note is that the probable demands for

TABLE XLIII

SHOWING ESTIMATED LIFE OF BUILDINGS IF THIS PROGRAM
IS FOLLOWED

Building	Estimated Date of Abandonment	
		It is hoped that a junior high school can be built in the Albany section during the 30's. If so however, it may be necessary to modify the plan as outlined in order to care for it on a cash basis.
Emerson.....	1940	These sites should be abandoned and not rebuilt. Add necessary units to LeConte-McKinley and to John Muir. It may be necessary to add on extra junior high school in this period.
University Elementary....	1946	
Oxford.....	1950	If Oxford is rearranged in a few years for junior high school service it may be possible to extend this date somewhat. To replace the two schools will cost near \$500,000.
Burbank.....	1956	
Thousand Oaks.....	1960	It may likely be necessary in this decade to the district to care for the rebuilding of these five schools. The cost will be approximately \$1,800,000.
Garfield.....	1962	
Willard.....	1965	
John Muir.....	1965	
Jefferson.....	1968	
Edison.....	1970	The cost of replacing these three plants will be in the neighborhood of \$600,000. If taxable wealth increases as expected, and if the above construction is properly handled it may be possible to handle this on a cash basis.
Hillside.....	1971	
Cragmont.....	1972	
Longfellow.....	1980	It should be possible to handle this period on a cash basis. If spread through the decade it would average under \$100,000 per year.
Whittier.....	1988	
Columbus.....	1989	
Franklin.....	1990	This should be handled by cash without difficulty. The total cost should not exceed \$750,000.
LeConte-McKinley.....	1993	
Part Time.....	1993	
New High School Units....	2000	

building outlays from 1934 to 1950 will be relatively small. Here, then, is Berkeley's opportunity to enter upon a cash basis. If this chance is missed the writer is not able to see that Berkeley can ever look forward to anything but debts so far as school buildings are concerned. In the 50's there will be a fair amount of building needed, and even if Berkeley goes on a cash basis and a continuous building basis in the late 30's or early 40's, it will require very wise management in the 50's to maintain it, and in the 60's it can probably not be maintained. Beyond the 60's it may be possible to straighten out the situation again and hold to cash procedure.

These figures are only estimates, but no one can dismiss them lightly. It is unfortunate that these demands are so unevenly spread out before us, but that is what intermittent building always does. It would seem that Berkeley ought to rise to its present opportunity to get over to a cash basis. To miss doing it means debt, intermittent building, and almost certainly a continuous decline in the character of school homes. These facts cannot be stared away. They are there, and not to act is to accept the inevitable consequences.

If we turn to Table XLI and examine the estimated tax rates, we see that in 1928 the rate of 27 cents will be required to carry the new debt. This rate rises to 46.1 cents by 1934, and then gradually declines. In the 40's the rate ranges from 33.7 cents to 25.2 cents.

If we compute the rates for the old debt, using the same basis as we have used in Table XLI, we find that the rate gradually declines from 37.8 cents in 1928 to 13.6 cents in 1947, when the new debt is paid off. In order to show that the actual debt burden is by this plan adjusted to the idea that this is to be the last bond issue, at least until in the 60's, the estimated tax rates required to cover the debt payments from 1928 until they are paid off in 1959, are charted in Figure 19. This figure shows the estimated rate for covering payments on the old debts and on the new debt separately and in combination.

After the gradual rise in the total rate to 1931, then we get a gradual and fairly even decline to 1947, then a sudden drop. It is at this point in the curve that a considerable cash will be required for new additions to buildings. It is not unreasonable to think that this cash demand will begin in the year 1938 in a small

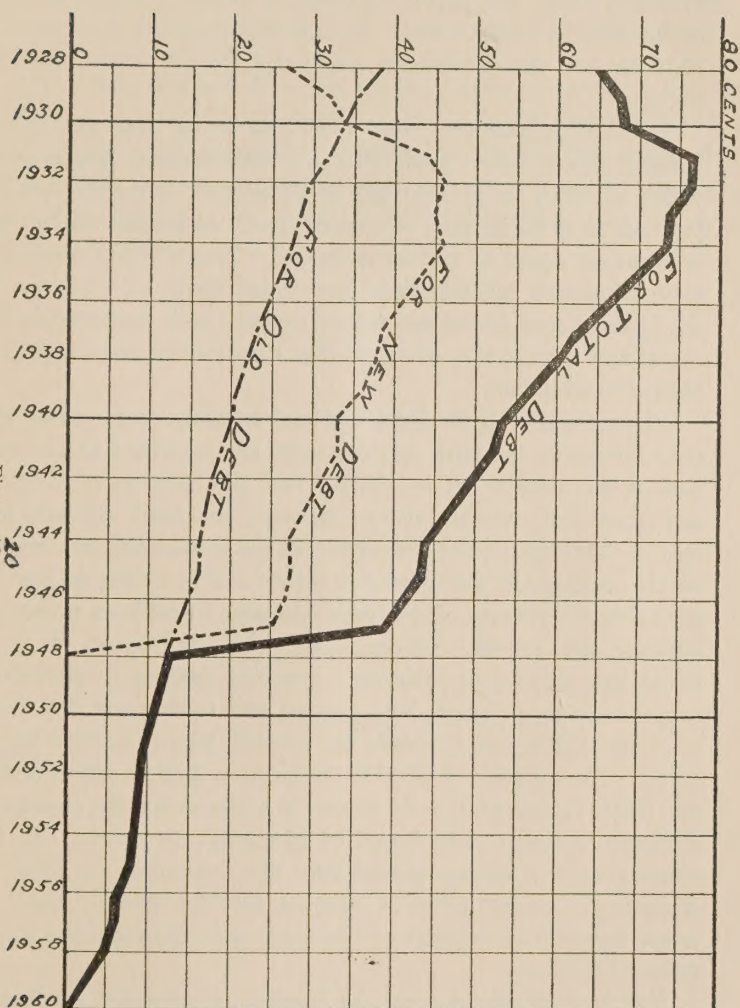


Figure 12
Tax rate in cents per \$100 valuation necessary to liquidate proposed indebtedness.

way and grow enough so that the total outlay for buildings (the debt and cash rates together) will keep the curve from dropping. In reality then, this curve is presented as the Survey's estimate of the burden of debt cost. If cash requirements are met from 1938 forward the full burden would then be this curve plus cash outlays.

It is unfortunate that we are not able to say just what school housing should cost. Some time we shall develop standards by which we shall be able to say approximately what it costs per year per class for housing of a given type. At present no one who is informed would be willing to hazard a guess. Until the necessary exhaustive investigations have been made we must accept the kinds of studies and estimates that have been presented in this report and keep to the standards that have proved so successful in business and industry.

The estimates of Berkeley's school housing needs, costs, and debt burden as set forth in this report are presented as the findings of this survey. It is believed that the facts, as set forth in this report fully warrant every conclusion and every estimate presented. Throughout the investigations the commission has worked on the assumption that Berkeley wants and is willing to pay for good school buildings. It has been assumed, on evidence presented, however, that the city can not afford to be extravagant. It is believed that this report presents a complete analysis of Berkeley's school building program, both present and future, and that it reveals the situation as it should be revealed, *viz.*, as a single proposition. The question of whether the solution shall be undertaken in one single unified plan or in several is a matter for the citizens of Berkeley, through their board of education, to decide. In the opinion of the survey commission the arguments in favor of handling it as one problem running through several years are sound from the standpoint of education and also from the standpoint of economy.

The plan of distributing the burden as suggested by Tables XLI and XLII, that is, so that the cost is heavy at the outset, is believed to be thoroughly sound. The building needs are pressing and they must be met soon in large amount. Hence these costs cannot wisely be shifted forward except by delaying payment of principal, or by lengthening the term of the bonds. Both of these would endanger the chance of getting over to a cash basis. These

high costs through the next fifteen years must be thought of as payments for things that ought to have been paid for several years ago. They are the price of delay and of intermittent building. These costs should not be charged to the future but rather to the past.

It is fully realized that the program here proposed is not a light one. It is presented, however, in the belief that the people of Berkeley are in the habit of looking forward and not backward; that they believe in their city, and in the value of public schools; and that they have the courage and the determination to act on their convictions.

APPENDIX A

In the following two charts are presented plans for checking the playground space and equipment for elementary and junior high schools. On the left margin is a list of facilities required for carrying out a well balanced plan of free play and physical training. The items listed call for certain ground areas as indicated in columns 2 and 3. Naturally many of these areas can be used for purposes other than those noted in column 1. In column 4 is shown the maximum number of children for which each of these units provides at any given time. For elementary schools there are 12 units of play space listed. These areas are suited to 12 (or more) activities which, together would provide what physical education authorities regard as a suitable collection of activities for the physical and social development of children. A playground provided with 1 each of these 12 units would provide suitable play activity for a maximum of 215 children if all areas were filled at one time. This would be a total of 39,368 square feet, or 183.1 square feet per pupil. If but 100 square feet per pupil were available, then we would have but 21,500 instead of 39,368 square feet. This would eliminate 45 per cent of the space called for by this scheme of instruction and so, substantially abbreviate the training possibilities.

It will be noted in the third from the bottom line of these tables that the number of square feet per pupil required is in all different sized schools well above 100. It must be kept in mind that this refers to the maximum number of pupils actually using the grounds at any given time and not to the total enrollment. In a school of 1000 pupils the number on the grounds at any given time will rarely exceed 500. Accordingly, this standard is not higher than the old standard of 100 square feet per pupil. If we assume that the number on the playground is half the school enrollment, then the figure here showing the square feet per pupil would be divided by 2, in which case it is evident that this standard calls for less than 100 square feet per pupil. This assumes that we have a maximum load on the grounds. Of course there is often less than a maximum load, in which the per pupil square footage would be higher.

AREA AND EQUIPMENT REQUIRED FOR PHYSICAL TRAINING ACTIVITIES

FOR SIX GRADE ELEMENTARY SCHOOLS OF VARIOUS SIZES

Assuming Organization of all Children at one time for Physical Education Class Assignment (1)

Standard Equipment and Facilities	(2) Unit Dimensions Feet	Unit Area Sq. Ft.	Pupils Accommodated per Unit at One Time	Number of Units of Area or Equipment and Sq. Ft. of Area Needed for Schools with Playground Load of the Following Numbers of Pupils. (A Playground Load of 100 Pupils would Mean a School of 200 Pupils.)																	
				100-200		200-300		300-400		400-500		500-600		600-700		700-800		800-900		900-1000	
				Units	Area	Units	Area	Units	Area	Units	Area	Units	Area	Units	Area	Units	Area	Units	Area	Units	Area
Field for Tag and Miscellaneous Running Games.	40x80	3,200	40	1	3,200	1	3,200	3	9,600	4	12,800	5	16,000	6	19,200	7	22,400	8	25,600	9	28,800
Field for Soccer and Playground Baseball Diamonds	120x220	26,400	25	1	26,400	1	26,400	1	26,400	2	52,800	2	52,800	2	52,800	2	52,800	2	52,800	3	79,200
Volley Ball Court	35x70	2,450	20	1	2,450	1	2,450	2	4,900	2	4,900	2	4,900	3	7,350	3	7,350	4	9,800	4	9,800
Basket Ball Court	45x70	3,150	30	2	6,300	2	6,300	2	6,300	3	9,450	4	12,600	4	12,600	5	15,750	5	15,750	6	18,900
Hand Ball—Double Court	30x60	1,800	10	1	1,800	1	1,800	2	3,600	2	3,600	2	3,600	3	5,400	4	7,200	4	7,200	4	7,200
Travelling Rings	15x50	750	15	1	750	2	1,500	2	1,500	2	1,500	2	1,500	2	1,500	2	1,500	2	1,500	2	1,500
Flying Rings	12x20	240	5	1	240	2	480	2	480	2	480	2	480	3	720	3	720	4	960	4	960
Horizontal Ladder	10x25	250	15	1	250	2	500	2	500	2	500	2	500	2	500	2	500	2	500	2	500
Horizontal Bars	12x27	324	15	1	324	2	648	2	648	2	648	2	648	3	972	4	1,296	4	1,296	4	1,296
Jumping Standards and Pits	(10x12) (6x20)	240	20	1	240	1	240	1	240	1	240	2	480	2	480	2	480	3	720	3	720
Low Horizontal Bars	12x27	324	15	1	324	2	648	2	648	3	972	3	972	3	972	3	972	4	1,296	4	1,296
Low Flying Rings	12x20	240	5	1	240	1	240	1	240	1	240	2	480	2	480	2	480	2	480	2	480
TOTALS		39,368	215		42,518		44,406		55,056		87,930		94,960		102,974		111,448		117,902		150,652
Sq. Ft. per Pupil					173.5		143.2		131.0		165.9		151.9		144.0		137.5		129.5		149.9
Acres					.97		1.01		1.26		2.01		2.17		2.36		2.55		2.70		3.45
Number of Pupils Accommodated Noon Lunch					245		310		420		530		625		715		810		910		1,005

(1) Such organization must include leadership by teachers and selected pupils in accordance with a carefully arranged plan to secure sufficient activity for every pupil.

(2) Unit dimensions include the minimum space necessary for margins about apparatus and courts.

To illustrate the actual working of this standard, let us take a school with 100 pupils. By this standard this would call for 42,518 square feet of land or 425 square feet per pupil. However, this amount of land could care for 245 pupils at one time. If this is half the enrollment then the 42,518 square feet would provide proper play facilities for a school of 490 pupils. This would be slightly less than 87 square feet per pupil. Again, a school of 2000 pupils would have a demand for play space for 1000 pupils. This would call for 150,625 square feet of area or 150.5 square feet per pupil on the ground, or 75.3 square feet per pupil enrolled in the school. This would be assuming that the school had all the pupils necessary to provide a maximum playground load. This same 150,652 square feet would be necessary for a school of 1900 pupils. With this enrollment the standard would call for almost 80 square feet per pupil.

In some cases, however, this plan would call for slightly more than 100 square feet per pupil. The maximum load on a playground of 55,056 square feet would require only 69 square feet per pupil. This maximum, however, is the minimum load for a playground of 87,930 square feet, or 109 square feet per pupil. Thus, this schedule would in some few instances (when only a minimum load of pupils is available) call for slightly more than 100 square feet per child.

In general, however, it will be seen that this standard is more conservative than the old standard, except when the school is very small and when it is passing from one to another group of requirements. A school of 100 pupils needs a baseball field, but this same field will serve a school of 800 pupils.

It is conceivable that the nominal playground load will be found to be more than 50 percent of the enrollment in some schools. If so, then this method will require more ground than is here suggested.

The merits of the plan of measurement here presented, however, are not mere saving of cost for land but, rather, in the fact that it judges a playground in terms of the educational service it is possible to get from it.

The junior high school plan is explained in a similar way. The scale of measurement is set forth in the table for schools of several sizes.

These measures were applied as follows: A map of the dis-

AREA AND EQUIPMENT REQUIRED FOR PHYSICAL ACTIVITIES

FOR JUNIOR HIGH SCHOOLS OF VARIOUS SIZES, ASSUMING THE ORGANIZATION OF ONE-HALF OF THE CHILDREN AT ONE TIME IN
PHYSICAL TRAINING ACTIVITIES (*)

STANDARD APPARATUS, COURT AND PLAYING FIELD UNITS	Unit Dimen- sions Feet	Unit Area Sq. Ft.	Pupil Accommo- dation per Unit at One Time	No. of Units of Areas or Equipment, and Sq. Ft. of Area needed for Schools with Playground Load of the Following Nos. of Pupils							
				Less than 500		501-750		751-1000		1001-1250	
				Units	Area	Units	Area	Units	Area	Units	Area
OUTDOOR:											
Field for Soccer, Pass Ball, Playground											
Baseball, Field and Track.....	360x210	75,600	80	1	75,600	1	75,600	2	151,200	2	151,200
Volley Ball Court.....	35x70	2,450	20	2	4,900	4	9,800	4	9,800	6	14,700
Basket Ball Court.....	45x70	3,150	12	2	6,300	4	12,600	4	12,600	6	18,900
Hand Ball—Double Court.....	30x60	1,800	8	2	3,600	2	3,600	2	3,600	4	7,200
Tennis Court.....	55x115	6,325	4	4	25,300	4	25,300	4	25,300	6	37,950
Horizontal Bars.....	12x27	324	10	1	324	1	324	2	648	2	648
Horizontal Ladder.....	10x25	250	10	1	250	1	250	2	500	2	500
Traveling Rings.....	15x50	750	5	2	1,500	2	1,500	2	1,500	2	1,500
High Jump Pit.....	10x12	120	10	1	120	1	120	1	120	2	240
Broad Jump Pit.....	6x20	120	10	1	120	1	120	1	120	2	240
Total Outdoor Area.....		90,889	169		118,014		129,214		205,388		233,078
INDOOR:											
Exercise Floor.....	40x70	2,800	40	1	2,800	1	2,800	2	5,600	2	5,600
Room for Corrective Gymnastics.....	20x30	600	20	0	0	1	600	1	600	1	600
Rest Room.....	20x30	600	20	1	600	1	600	1	600	1	600
Swimming Pool.....	40x90	3,600	30	0	0	0	0	1	3,600	2	7,200

*Since all work in the junior high school is departmentalized, the peak load on the playground and in the gymnasium does not come during the regular instruction period, but during the noon hour. Experience shows that facilities should be ample to permit of the organization of one-half of the enrollment in physical activities during the noon hour.

tract was prepared showing the amount and form of the play area. Cardboard forms, cut to the map scale, were prepared for each of the areas called for in the schedule. These forms were then laid down on the school map. Also check was made of the placement of apparatus and the arrangement of the various areas on each of the grounds.

APPENDIX B

ADMINISTRATIVE UNIT FOR JUNIOR HIGH SCHOOL

Herewith are presented illustrations of three important features of a school plant. These were selected largely because these are points at which Berkeley's school buildings were found weak. They are offered merely as illustrations embodying principles of schoolhouse construction.

The accompanying floor plan in Fig. I presents suggestions for the arrangement of an administrative unit for a junior high school. In its scope and general arrangement it suggests the cosmopolitan interests and needs to which the junior high school seeks to administer.

The plan is so well labeled that it needs no explanation. It is complete and suggests a proper relation to the commercial work of the school on one side, to a main corridor of the building, to the lobby, and to the assembly hall. It concentrates the administrative services and facilitates co-ordination. It brings student activities under the supervision of the principal; it provides for the janitor, and offers a proper contact with play grounds.

Figure I

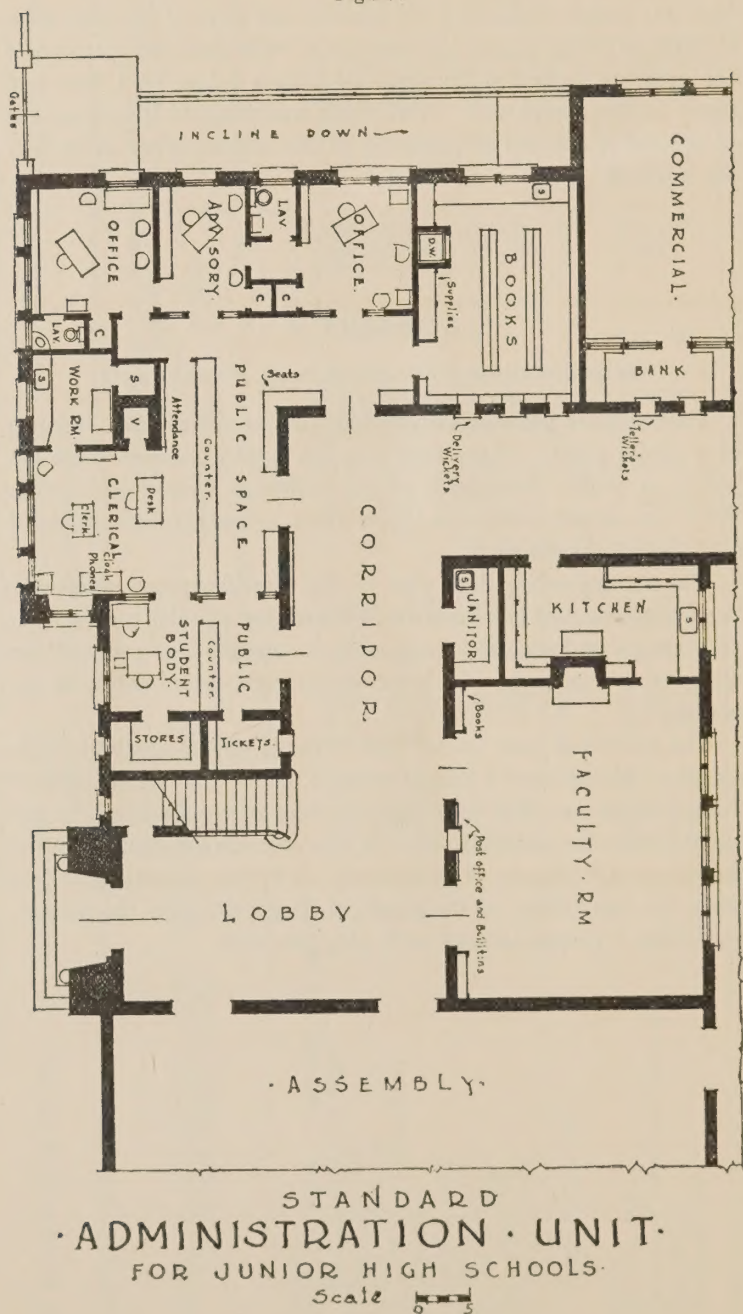
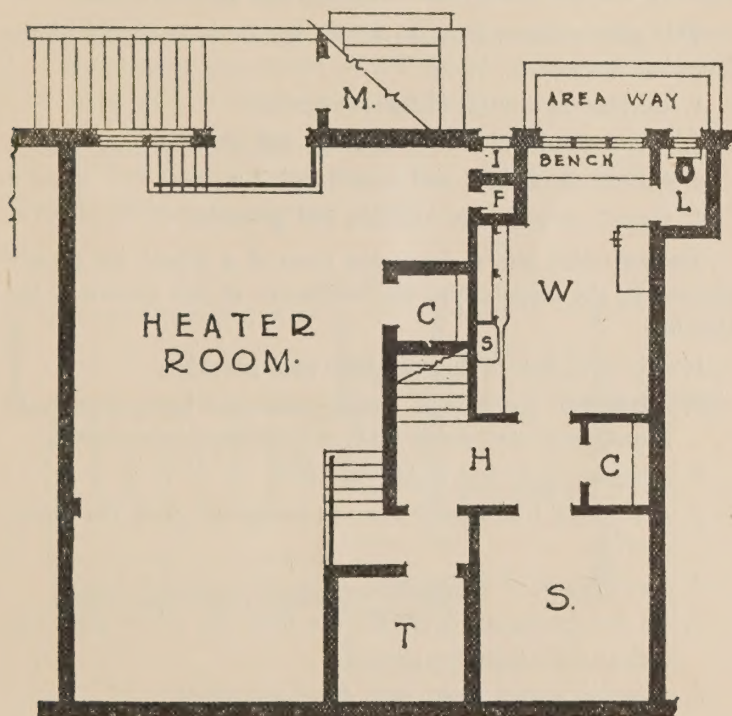


Figure II

JANITOR'S QUARTERS.

GRAMMAR SCHOOL. Scale 0 5



· L E G E N D ·

M	METER ROOM.
I	INCINERATOR STACK.
C	CLOSETS
W	JANITOR'S WORK R'M.
H	HALL.
S	STORE ROOM.
T	TRANSFORMER ROOM.
L	WATER CLOSET.

JANITOR'S QUARTERS

The accompanying floor plan (Figure II) is largely self-explanatory. It is suited to a typical elementary school plant and makes clear the essential features of this important unit.

This plan assumes that the school janitor is in charge of the following service:

1. Engineer in control of heating system.
2. Minor repairs about the building and grounds.
3. Custodian of tools and housekeeping supplies.
4. General caretaker of building and grounds.

The operating and maintenance costs of a school are greatly affected by the organization and equipment of this feature of the building.

It may be explained that this floor plan provides:

1. An engine room with outside entrance large enough to admit a new steel boiler when required.
2. Adequate light and inside entrances.
3. A fireproof transformer room in connection with the engine room.
4. A compartment for meters.
5. An incinerator available for use from the school yard (as well as from hallways above).
6. A janitor's work room, with closet and toilet.
7. A storeroom for janitor's supplies.

If the janitor has a tool closet opening on the yard, a service and storage closet in each end of a building (1000 pupil school), and proper cleaning equipment installed, the operation of the building would be simple.

BOYS' TOILET—ELEMENTARY SCHOOL

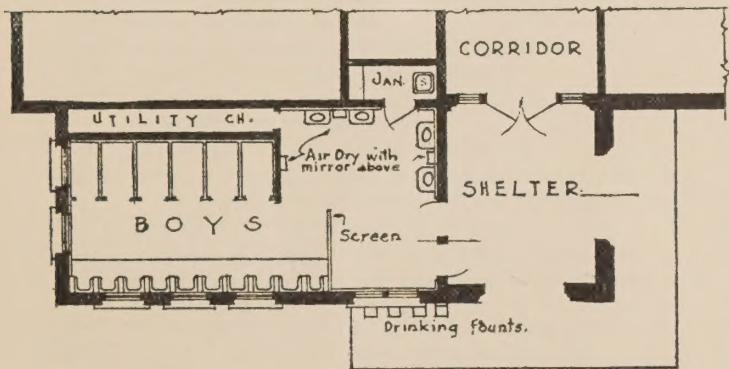
A third feature of importance in a school building is the toilet. The accompanying floor plan, Fig. III, suggests the important features. It provides for:

1. Ample light and sunshine.
2. Cross ventilation, by having three sides exposed.

3. Entrance from within or from the playground.
4. A mop sink, space for hose storage, and storage space for cleaning materials.
5. Lavatories against wall in suitable proportion to toilets and urinals with air dry service for each.
6. Utility chamber back of toilets and provided with entrance door and a drain in the bottom sloping to the outside.
7. A 12" step 5" high in front of urinals.

This kind of toilet can be supervised from the playground, it is easily kept clean and free from odors, and is available for use when the building is otherwise closed.

Figure III



BOYS · PLAYGROUND ·

BOYS' TOILET · STANDARD ARRANGEMENT FOR GRAMMAR SCHOOLS.

Scale



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